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MSX User

JULY 1985
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Contents

REGULARS

5 Front — Encouraging words
6 Pulse — New developments on the MSX scene
8 East — The view from Japan
38 Contact — Index of MSX software houses
70 First Aid — Eric Doyle helps with your sprite problems
74 Soft Options — Your guide to the latest releases
80 Feedback — Our readers air their views

CROSSWORD

66 Competition Results — The winner and the solution of our great Mitsubishi ML-F48 contest

FEATURES

10 Laserdiscovery — Jeremy Vine thrilled to the new Pioneer interactive video system
13 Astar is Born — Eric Doyle looks closer at a new storage device
16 Pathfinder — Steve Lucas's adventure series anticipates the future
19 Widening Net — Karl Dallas continues his investigation into the wired society
30 Under The Spell — Profile of Steve Webb, author of Sorcery and MSX defender
32 Inside the Wreck — Journey into the depths of Electric Software's watery game

PROGRAMMING

26 On File — Bob Maunder puts the finishing touches to your club records
34 MSXplained — Graham Knight and Stuart Pirie's series proceeds to printer commands
67 Safe Keeping — Karl Dallas on the ins and outs of disk storage

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MSX AT WORK

14 Business Sense — Finding the right source for your serious applications
73 In the Balance — Colin Wilton-Davies checked Kuma's Spreadsheet

LISTINGS

43 Balloon Burst — Arcade action
46 Key Notes — For musicians
48 Sounds — Envelope shaper
50 Sketch Pad — For artists
52 Sink the Ship — Action at sea
57 Designer — Graphic utility
62 Zombie Island — Spooky fun

VOLUME 1 NUMBER 8 JULY 1985

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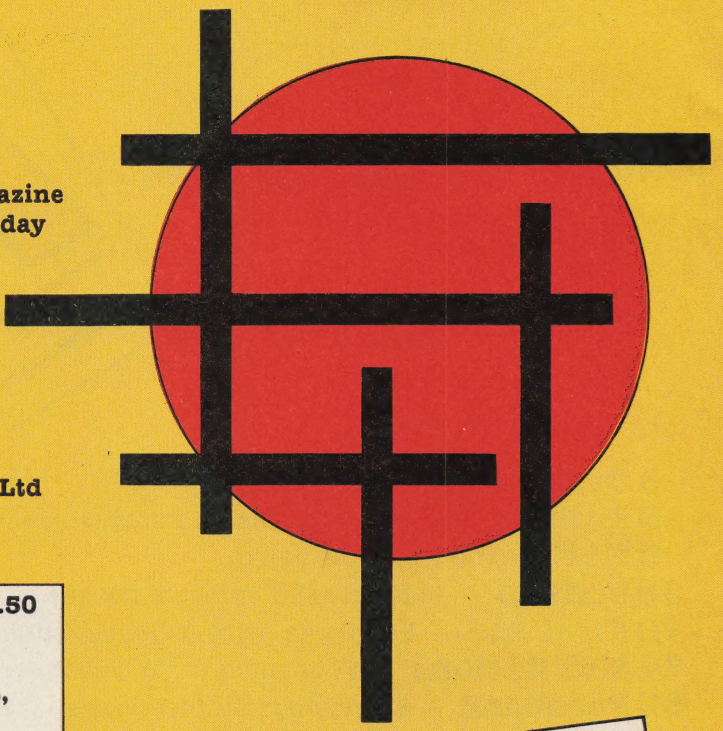

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NEXT MONTH

Second Generation — An exclusive look at MSX Mark 2

Secrets of Sorcery — The clues you need to rescue the wizards in Virgin's graphics adventure

PLUS

First Aid — Steve Webb, profiled this month, dons our MSX doctor's uniform

New BASIC course for novices, news from Japan, more adventures explored, software reviews, listings

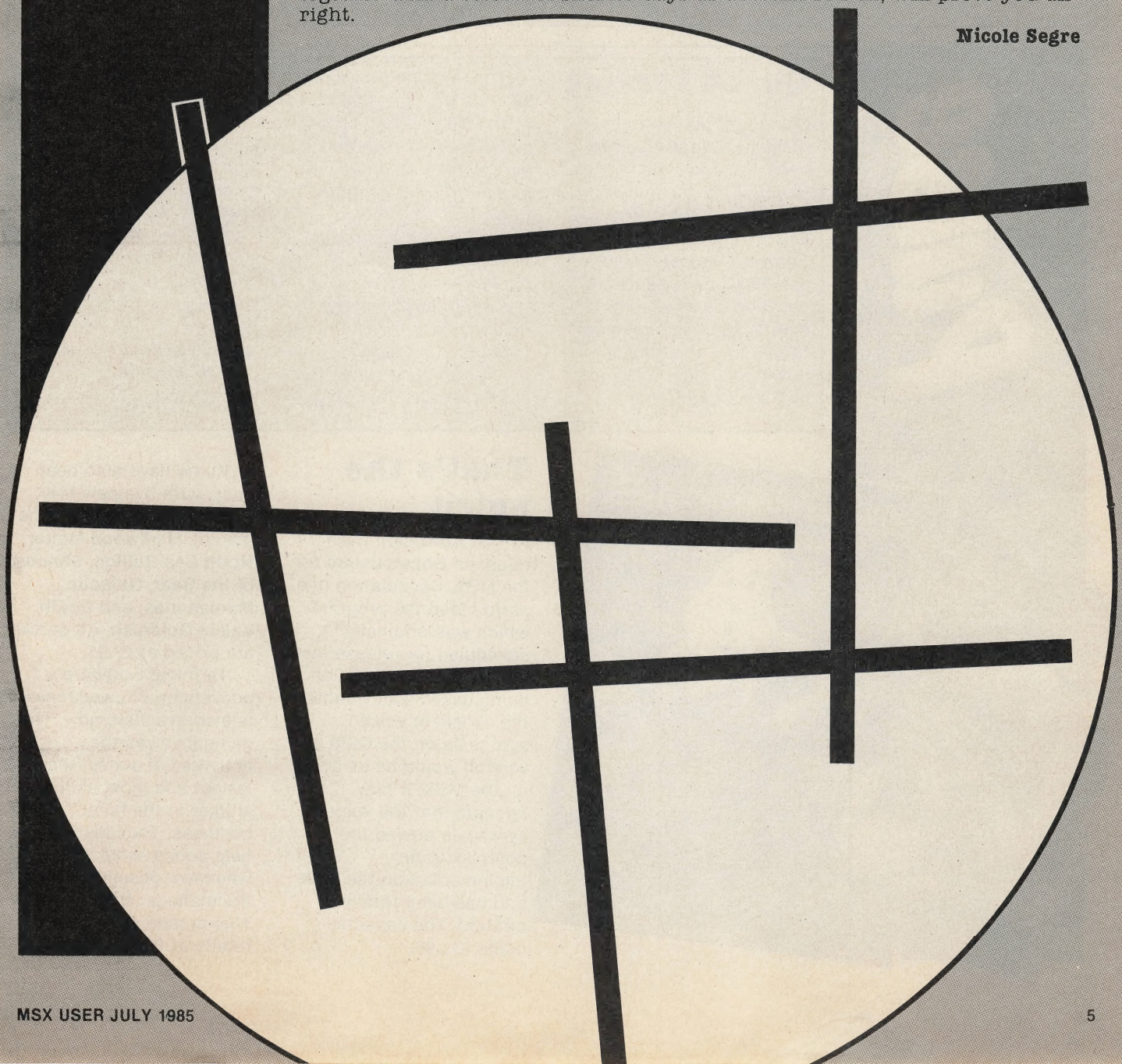
MSX Front

In the continuing absence of an MSX boom, a situation aggravated by the traditional calm that descends on the computer market during the summer months, it would be easy for us here at MSX User to fall prey to gloom. However, one of the things that keeps us soldiering gamely on is the excellent response we have been getting from you loyal readers. We do not always have room to publish your letters, nor is there time in a hectic schedule to answer them individually, but be assured that we do take note of every single one. Your letters are the best guide we have as to the ideas and interests you would like to see reflected in the pages of this magazine — not to mention a much valued source of encouragement — so please keep writing to us.

One of the messages which has come across most clearly is that our listings pages are much appreciated as a supplement to the meagre software diet on which many of you are subsisting. Which brings us to another request — send us more of your programs so that we can continue to improve our listings section in both quality and quantity. To spur you on, we are ever increasing the fee we are prepared to pay for programs, as you will see on the facing page.

In the meantime, you will find a particularly generous crop of both games and business software reviews in this month's issue, together with our usual up-to-the-minute reports on the current state of the MSX scene and abundant programming advice. Our profile this month is with a leading programmer who believes that MSX will become 'a huge success' — a confident view which many of you already share. It only remains to be seen whether developments such as MSX 2, soon to be revealed to the world, together with a return of shorter days as autumn sets in, will prove you all right.

Nicole Segre



Sanyo offer

Sanyo is offering a special package deal with every MPC 100 computer sold. The package consists of SLIM 11 cassette recorder, MJY-002 MSX joystick and a **Talking Software** tutorial program by Headline Communications of Hereford.

The recorder has full cue and review facilities and includes a built-in microphone and speaker. The tutorial pack is designed for use on the recorder and it combines recorded speech with example programs.

The computer and its package will retail at the normal price of £299.95.

Pulse

Quick service

Owners of Mitsumi quick drives will be pleased to hear that servicing facilities for these units are now available in Britain. Cumana, one of Europe's largest disk drive suppliers, have opened a new service and repair centre which is equipped to cater for the Mitsumi drives and most makes of home computer.

The Mitsumi drives use 2.8 inch double sided disks giving 64K storage on each side. Unlike conventional disk systems the data is stored on a single spiral track, like a LP record, instead of the usual track and sector concentric circle arrangement.

The great advantage of quick drive systems is that they load and save programs much faster than cassettes and they also display a directory of disk contents. To support the drive a ROM cartridge connector is used which adds extra commands for drive control to the resident MSX BASIC.

Mitsumi QD-64 drives cost £138 from Micro Link, 'Bowyers', Steep Marsh, Liss, Hants. Cumana Services can be contacted at the Royal Industrial Estate, Daventry, Northants.

That's the spirit

At last Activision have released **Ghostbusters** for the MSX. Speculation has surrounded the program which was originally scheduled for release last December. The question being asked was whether the excellent voice synthesis on the CBM 64 version would be as good on the MSX. It now appears that the voice synthesis proved too complex to be implemented on the MSX and has been totally omitted. The cassette costs £11.99.

Kuma have also been busy, with five new MSX graphic adventures on the market: **Darkwood Manor, North Sea Bullion, Shadow of the Bear, Galactic Mercenaries,** and **Death Valley Goldrush.** All games are priced at £7.95.

Terminal Software's conversion of **Lazy Jones** is also available now. The game involves the activities of Jones, the laziest and most skilled shirker in the hotel business. The idea is to help Jones avoid work whenever possible without the manager finding out. This arcade style game retails at £8.95.

Anti-static mat

The release of AKG Acoustics' static elimination mat has been well timed. It follows the recent report by BBC Television's Tomorrow's World on the damaging effects of static electricity on microchips. This new product aims to reduce the dangers.

Static charges can be built up in the body merely by walking on a nylon carpet or by wearing nylon clothes. Most people have experienced the short, sharp shock of static and know how powerful such a discharge can be.

Microchips consist of many layers of circuitry with extremely thin insulation plates sandwiched between them. A static discharge can jump across the insulators and cause a permanent short circuit within the chip which may not be apparent for a very long time.

The mat counteracts this effect by giving the charge an easy passage to earth. At a price of just £11.99, it could prove to be a cheap form of insurance.

BIOSed view

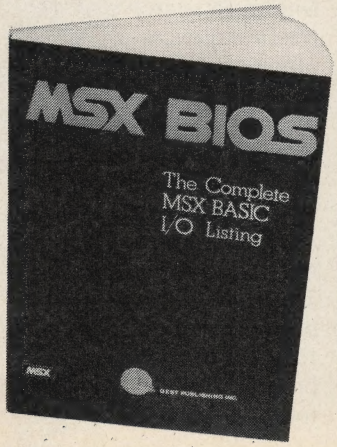
American publishers, Qest, have produced a manual on the BIOS (BASIC Input/Output System) routines which form the operating system for MSX BASIC.

This is the only book currently available which gives disassembly listings of these routines. It should prove invaluable to serious machine code programmers who wish to utilise some of these ROM routines.

Priced at around £50, the book is not aimed at a mass market, but for those who require this kind of detailed information the only alternative is to disassemble the ROM and then decipher the code.

Qest Publishing also produce a ROM emulation board (REB 32000) for commercial program development. This device interfaces the MSX with any computer with a Z80 assembler and allows programs to be developed on larger systems such as the VAX 11/780. Described as 'a low-cost system', it is priced at around £800.

Further information can be obtained from Steve Ting, Qest Publishing Inc, 39W 32nd Street Suite 800, New York NY 10001.



Classic entertainments

Melbourne House have released their second program for the MSX, **Classic Adventure.** The game is one of the best known Fortran language adventures to survive into the 80s.

Though the Fortran version spanned over 200K of memory, the Melbourne House team claim to have caught the excitement of the original in this text-only version for the MSX.

The computer acts as the player's eyes and hands in the quest to wrest treasure from the mystical Colossal Caves. Magic and illusion play a large part in the game and the adventurer must be wary of the many objects collected along the way because of the strange side effects they create. Many of the treasures are guarded by ferocious dragons or trolls which must be bribed or killed before the final goal is reached.

Joining **The Hobbit** in the Melbourne House catalogue, Classic Adventure is available for £6.95.

Holograph broadside

Holograms are appearing as security protection on commercial software packages. A&F Software have decided to follow this trend with the inclusion of a holographic image on their latest game, **Chuckie Egg 2,** which will be available for the MSX later this year. A logo is affixed to each cassette to distinguish the authentic product from pirate copies.

The whole subject of program security has long been a thorn in the side of software houses and the new reflection holograms are seen as an excellent way to continue the fight against piracy. This follows the introduction of holograms onto credit cards issued by the large banks.

Recent developments have shown that holograms are not as secure as it was at first thought, as laser equipment costing around £100 can be used to make convincing copies. However, at the very least, the holograms have nuisance value in discouraging the large-scale copying of commercial packages.

Showpiece

Toshiba will be presenting the 'living room of the future' at the Personal Computer World Show, which takes place on 4-8 September. The room will show how an MSX can be integrated into a home entertainment system, interfacing with hi-fi and video equipment. It is hoped that other home control applications will be demonstrated but the final details are not yet available.

Previous PCW Shows, Britains biggest personal computing event, have taken place in Olympia 2. This year it will house a business user section, while the larger National Hall will be reserved for the home user. This move reflects the more serious approach to micros in small businesses which has been apparent in recent months. As usual the Show promises to be an ideal opportunity for the first-time buyer or seasoned computer user to gain information and advice on every facet of the computer world.

East

Fare play

European visitors to Japan are always amazed by the standard of the taxi service. The drivers are always resplendent in chauffeur's uniform complete with gloves, and the cars are scrupulously clean.

It is no surprise to find many are equipped with TV. The set is fitted in the space beside the gear lever and can be viewed by backseat passengers. Passengers put coins in a slot and can remotely scan through Tokyo's eight TV channels.

Some of the latest taxis have the TV fitted with an MSX option. You put extra money in the slot and then play the latest Konami games while being driven to your destination. The taxi I was travelling in was fitted with a National Panasonic TV and a Hitachi MSX computer. Playing **Kung Fu** on the MSX apparently takes all the frustration out of being in a 20-minute traffic jam.

I've even been driven into Tokyo from Narita airport by a driver who also had a TV set in the front. He watched the baseball while he drove. Thank goodness he didn't have an MSX and joysticks as well.

American success

Just as the film Ghostbusters has been a great success in Japan so too has the MSX Ghostbuster cartridge. It is currently one of the hottest items of MSX software and the game's designer David Crane has been doing the rounds of magazines and TV stations.

The late-night TV programs have been running a special feature on the creators of computer games software. As the first American MSX success, David Crane has been very much in demand for interviews — almost like a visiting pop-star.

Ponyca Software, the Japanese distributors for Activision USA, have done a great job in promoting the product. They have been giving away thousands of MSX lapel badges with the familiar Ghostbuster symbol. Kids everywhere seem to be wearing the badges — all advertising the film and the MSX cartridge.

Ponyca are following up their Ghostbuster success by releasing other Activision titles like **Beamrider, Pitfall I and II, Hero** and **Explorer's Club.** To tie in with these, Ponyca are giving away patches which the youngsters sew on to thier American-style denims — Japan is truly becoming Westernised.

C compiler

There are now three disk operating systems for MSX computers, equipped with 64K of RAM memory. MSX-Disk BASIC has been available in Japan for the last 18 months and has software built into a ROM in the disk unit which extends the standard MSX BASIC with disk handling commands.

MSX-DOS is an operating system which loads from disk and leaves the user with 60K free. MSX-DOS is similiar to Digital Research's CP/M operating system and is also compatible with the 16-bit files used on professional computers like the American IBM PC.

A third disk operating system just released by ASCII is an MSX version of the popular C language. This is mainly used by professional programmers to produce fast-running programs. ASCII have put together an interesting C package which consists of Macro 80, Link 80, and the C compiler itself.

MSX C has been registered as a trademark by ASCII-Microsoft and the compiler package sells for £300. The price may sound high to home users but it compares favourably with C compilers available for other micro systems and proves that MSX is a computer that the professionals take seriously. Further compilers are presently under development including some for the tape-based home user.

Wavy 3

Sanyo have recently added yet another MSX computer to their wide range. Called the Wavy 3, it has a very stylish silver and black finish and it incorporates an excellent full travel keyboard. The most striking feature on the Wavy 3 is that it has three cartridge slots along the top. Special buttons above the full-size cursor keys select cartridge 1, 2 or 3. A fourth key selects a start in MSX BASIC. To me it looks much better than the new Sony, which some dealers call the 'Sputnik' because of its futuristic styling and shape.

Both these new models from Sony and Sanyo are competing at the lower end of the MSX market as each sells for around £160. No expense has been spared on the Wavy 3's keyboard but it does just have 16K of user RAM which leaves 12K free in BASIC. It does of course have the usual MSX BASIC in a 32K ROM and has a separate 16K dedicated to the video memory like all the other MSX computers.

Low memory MSX micros are popular in Japan and sell mainly to first time buyers who want a computer simply for entertainment. The

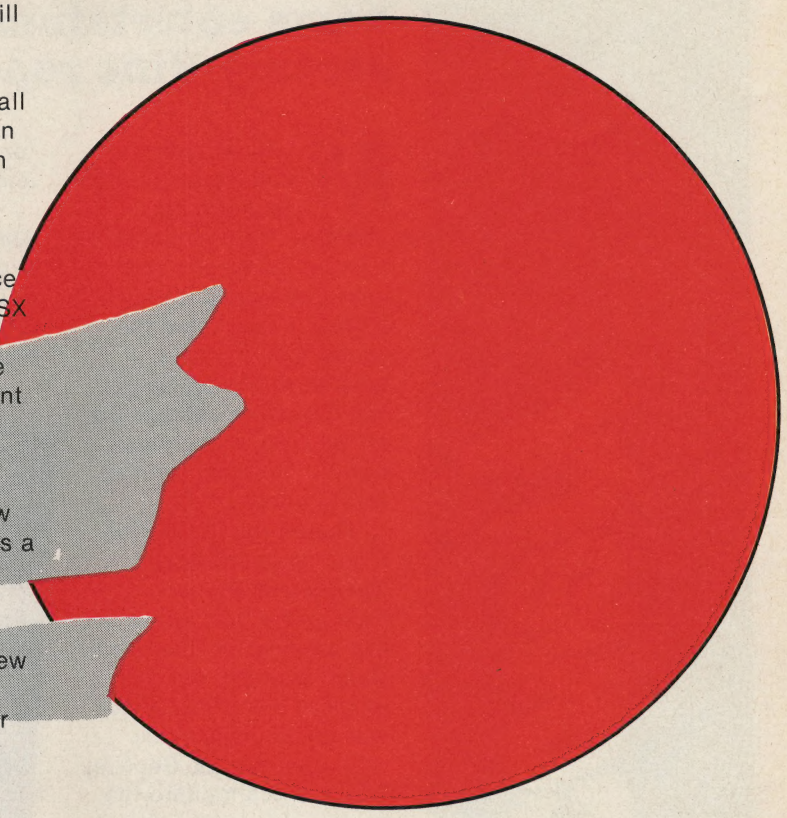
Japanese like the instant loading of games cartridges so having an instant selection on the three slots has obvious appeal.

As the users become more interested in their computers and start programming they soon find that they would like more RAM memory. The Japanese companies recognise this need for more RAM and almost all of them make memory extender cards which simply plug into a cartridge slot to give the user a full 64K computer. The user can then run MSX-DOS, MSX-C and all the large memory database programs. Plugging in the extra memory cartridge still leaves the Wavy 3 with two cartridge slots free and gives it more facilities than some of the more expensive MSX micros.

The Sanyo decision to manufacture a low cost, low memory computer with a proper keyboard and three cartridge slots is extremely clever. MSX BASIC can already support up to 1 Megabyte of RAM memory and another manufacturer — Toshiba — has recently announced the sale of 256K RAM memory chips. Toshiba have also announced that they will be delivering a single chip with 1 Megabyte of memory in 1986. Once these 256K memory devices become available in volume at low prices someone will bring out an extender for MSX with 256K. Think of the possibilities with a Wavy 3 and its three memory slots.

It is interesting to see how the manufacturers are responding to the public demand for MSX computers. The new Sanyo fits into the lower price MSX market which starts with the rubber key Casio at £90 and goes up to the Pioneer system with interactive LaserVision discs at over £1000.

The manufacturers will also soon be releasing MSX computers which have far fewer chips — all the TTL devices will soon be on one chip and soon the sound and video processor will be integrated. The new memory chips will reduce the complexity of the MSX computer and help keep prices stable. Due to the reduced component count some makers are incorporating more interfaces into the computer — like the new Toshiba HX-22 which has a RAM disk and an RS232 serial interface built in. The real advantage for users is that all these new MSX models are fully compatible with all other MSX models.



Mighty mouse

Yamaha have introduced an MSX mouse, the MY-01. It is similar in style to the Apple Macintosh mouse except that the Yamaha one is finished in black and has two press buttons. As the mouse is slid across the surface of a desk or table, the rollerball on the underside moves and sets the position of the screen cursor.

The mouse is especially useful for drawing pictures on the screen and it plugs straight into any MSX joystick socket without needing extra hardware. Previous issues of *MSX User* have described the wide variety of Yamaha musical interfaces which are available as separates in Japan and can therefore be plugged into any MSX computer.

One new cartridge is the Yamaha YRM32 which contains a special ROM program used to connect Yamaha's CX5 with their highly popular RX11 digital rhythm programmer. Serious electronic musicians love the cartridge as it gives them a ful computer screen instead of the small single line display on the rhythm unit.

The RX11 costs more than £500 in Japan and is used by musicians to provide programmed rhythm accompaniment. When it is connected to an MSX, the screen can show the sound patterns on a display which is equivalent to that on top professional studio equipment. With the YRM32RX cartridge it is possible to pre-program clapping, cymbal crashes, cowbells, shakers, hi-hat cymbals, and a mass of different drum sounds including rim-shots and toms.

These effects can all be programmed using the mouse to control the cursor which moves across the screen selecting the appropriate modes, all the MIDI connections, the introductions, the frills, and all the other accompanying sounds. The mouse works particularly well with the setting of the sound patterns.

In this pattern editor mode the screen on the computer display looks like the controls of an expensive graphic equaliser with 20 different sliders. These sliders can be moved up and down with the mouse — just as if you were moving the controls on an equaliser. The sound patterns can be printed or saved to tape for future recall and modification.

The MSX mouse and the YRM32 are already being demonstrated on the streets of Nipponbashi with electronic bands playing all Yamaha equipment outside the shops on Saturdays and Sundays.

Laserdiscovery

The new Pioneer PX-7 promises to lead the way in home entertainment. Jeremy Vine reports.

My illustrious colleagues at *MSX User* are not unknown for their sense of humour, so when I was asked to write a review of a chair, I suspected the worse. Could it be a belated April Fool joke? But they were serious. So armed with a day return ticket, I ventured forth to West London.

There I found Geoffrey Pflaumer, marketing manager for Pioneer. Pioneer are best known in this country for their in-car stereo systems but their range of electronic goods now encompasses the computer market. Geoffrey Pflaumer led me into the depths of Pioneer, where under lock and key lies a room full of electronic goodies. And, of course, the Bodysonic chair.

Sitting in the chair, I realised this was no ordinary assignment. On either side of my head where two objects that Geoff assured me were only audio speakers. I began to worry. On the right arm of the chair was a joystick. The lights faded and the TV in front of me sprang to life. And so did the chair. I was now in command of a star fighter, fighting my way through the Astron Belt. Every time I was hit by attacking space ships, the chair shook. This was no ordinary game!

I have already explained in previous articles the principles of interactive video. Pioneer will probably be the first company to release in Britain an MSX computer specifically designed to control video discs and give MSX an area where for once they are leaders and not followers.

The game I played, **Astron Belt**, is the prime example of how micros and videos can interact. A combination of Star Wars type film and computer

generated graphics blend to give the user a game that is quite literally 'out of this world'. What Pioneer have produced is not only a sophisticated games machine but, as Geoffrey Pflaumer points out, part of a greater home entertainments system. Before I look at that set-up however, a few words about the Pioneer PX-7 MSX micro.

PX-7

This is somewhat a preview of the new PX-7 MSX micro, due to be launched this summer for about £300. The micro departs, in many respects, from the standard 'box' we've come to expect. And the differences are not merely cosmetic either.

The first thing that is noticeable is that the micro is not encased in one box but two. The keyboard is separate from the main unit which contains the usual port connections and a front-loading cartridge port. The keyboard at a quick glance looks like the standard MSX job, but on closer inspection reveals three extra keys — COMPUTER, VIDEO and SUPER-IMPOSE. These allow access to the major non-MSX feature of the Pioneer system — a 40K video control ROM.

The new keys allow the micro to work in one of three possible modes, The COMPUTER key presents the usual micro screen we all know and love. The VIDEO key turns the computer's screen off and instead only shows the image from the video player, though micro commands still work. Finally the SUPER-IMPOSE key overlays the computer screen on the video image. What lies within the 40K ROM is still a mystery but even from these scant details it is possible to see

how one could prepare titles to overlay on video images.

Another item that departs from the MSX norm is the first title screen when entering the computer system. On power-up, the user is presented with the choice of entering either MSX-BASIC or P-BASIC. The latter is Pioneer's own extension to BASIC and contains the necessary commands to control the video machine.

Unfortunately the only manual available to explain the workings of this was in Japanese.

The PX-7 I was shown was not a British model and the UK version will be in a black casing rather than silver, as will be a newer version of the LD-700 disc player. There will also be a graphics tablet and joystick. The micro is 48K, expandable to 64K via the expansion slot. However like all MSX machines when turned on, there is less memory available than the 48K figure suggests — in this case 28751 bytes.

My brief look at the PX-7 left me with very favourable impressions and I look forward to its release. Now back to that chair.

Hi-Fi or Vi-Fi?

The Bodysonic chair was not developed specially for the micro but is part of Pioneer's leisure entertainment set-up, of which the micro is part of the system. The chair complements the audio Hi-Fi players and now the video disc players to allow the user to relax and

experience the sound and/or vision being produced. The real dramatic effect comes when the laser disc is hooked up to the chair.

The chair contains subsonic transducers which provides the chair with vibrating rhythms in direct proportion to the sound being heard. By sticking a joystick on the arm-rest and coupling the PX-7 to the LD-700 laser disc player, you have the ideal interactive video system. The PX-7 is not being aimed solely at games players but shows the way in which the system can grow with the user's needs or complement existing equipment in the home.

Geoff Pflaumer calls this new home leisure entertainment equipment, Vi-Fi, as opposed to Hi-Fi. What does Vi-Fi mean? 'Hi-Fidelity Video' says Geoff, and goes on to explain how Pioneer are 'moving towards an integrated home entertainment system.'

In previous articles I have questioned the potential of the video disc player considering its limitations with respect to recordability. But Geoffrey Pflaumer does not see that as a problem. He is quick to point out how the 'visual/video aspect is becoming essential in the music industry'. This is certainly borne out by the fact that to make it to the pop charts today, you have to have a pop video as well as a cut disc. And of course the video player lies at the heart of a system which offers mass storage of information combined with audio and visual information.

Home entertainment is certainly a growth industry and although the prices of the equipment in total may seem prohibitive, each individual item stands on its own and can be added to your own existing equipment. Buying an LD-700 (disc player) for around £500 is not a pre-requisite of using the PX-7, merely an extension of the system that will find as many professional uses as it will in the home. I've already suggested the possible use of combining computer generated images with video pictures. The educational possibilities seem endless.

But what about the software (or do I say videoware now)? Pioneer showed me a few of the interactive titles already available and they are getting close to true interactive power. Astron Belt has to be the ultimate game to play at home and is an example of how film and computer businesses are getting together to produce spectaculars that would do credit to Return of the Jedi.

The video film on Astron Belt has the player flying through a hostile inter-planetary system with attacking ships, asteroid storms, and more. The player controls a ship on screen which is a fairly crude computer generated image. But because of the stunning film you hardly notice the disappointing graphics as you fight your way through the galaxy. Your only control is via the joystick, with which you try to dodge the approaching objects while attempting to destroy them with your laser gun.

One thing that caught my imagination straight away was the interaction between the micro and the video, and how it must have been working out screen co-ordinates. This is where the 40K control ROM comes in and information is relayed between the two machines. The video is no 'dumb' player only — it has its own built-in control system that allows it to send information back to the micro.

Another game I viewed was **Badlands** where I played the hero of a full-length animated western story. The animation is exactly the same as the cartoons on afternoon television but with the extra bonus of micro control. Badlands sees the player in the role of a cowboy who spends his time chasing an assortment of 'baddies' and killing them.

The only choice you have is to fire your gun, but your timing must be exact otherwise something nasty happens. And I mean, *nasty*.

But games will not be the major selling point of these machines and I don't expect to see many games for some time. The cost of video discs like Badlands, Astron Belt and **Strike Mission** — a fighter pilot simulation — is about 9,800 Yen apiece (about £30) and this in itself is a prohibitive factor.

At present most of the interactive software is coming from Japan where these systems are already available, but there is growing interest in producing interactive titles from software houses both in this country and in America.

Finally, that chair again. If you do decide to buy the PX-7 and LD-700, you might just consider the Bodysonic chair as well. However, before you rush out and buy one, it costs £600, and the footstool is an extra £100. It does, however, make you feel like Captain Kirk of the Star Trek Enterprise. Another thing I recommend is watching Michael Jackson's Thriller video — the screams really do send a shiver up your spine!

By the end of the morning at Pioneer, Geoffrey Pflaumer had to prise me out of the chair. I left Pioneer reluctantly and somewhat unsteadily as the vibrations of a ride in a sports car at 200 miles per hour had had a lasting effect on my body. I was hooked.

The PX-7 heralds the next generation of MSX machines and Pioneer certainly look like a name to watch out for in the MSX market.

Astar is Born

A storage device the size of a credit card could reshape MSX software. Eric Doyle reports

Retirement is on the cards for ROM cartridges with the introduction of a new solid-state memory storage device from Tokyo based Astar International.

The Astron card, developed for the MSX, is as small as a credit card, though slightly thicker, and should be cheaper to produce than a cartridge as the idea catches on. The cards permit the printing of a picture on one side with instructions on the reverse, and they can be stored in the same kind of fold-out wallet currently used for credit cards. Programs stored in the cards load as quickly as cartridges — in about four seconds for the largest 128K version.

Games and business software are already available in Japan so it should not be long before these are available to British MSX users. The expected price is around £14.95 per card initially, reducing to around the £12 mark eventually. An added expense is the adaptor which converts the cartridge slot to take any of these cards. It is expected to cost £5 but may at first be offered free as part of an introductory package of games.

The capacity of 128K means that the cards can hold very complex programs which may be loaded a section at a time, so that the effective memory size of the computer is much larger than the specified 64K.

At the moment only masked ROM and EPROM cards are available. Masked ROMs are custom-built chips which can only serve one function and are produced in the factory. EPROMs, on the other hand, are slightly more flexible because they can be 'blown', or programmed, easily with relatively cheap equipment. In both cases, once the program is on the chip it cannot be changed.

By the end of this year it is hoped that the range will include masked ROM, EPROM, eraseable EPROM and RAM versions. Erasable EPROMs are like normal EPROMs except that once programmed they can be 'wiped', or erased, under ultra-violet light.

The RAM card will be like a cassette tape or disk in that it can be used and reused simply by plugging it into the computer and giving a command to dump the current memory contents into the card. The trouble is that RAM is a volatile memory, and if there is no power supplied to the circuit then the memory contents will disappear. To prevent this happening, the RAM cards will carry their own small lithium batteries which will have to be replaced every two years.

So far the reaction to the cards has been cool in this country. In the words of Peter Ryde, Astar International's British representative: 'I am currently being inundated with requests from the rest if Europe, and Commodore have expressed an interest, but over here only four or five companies have shown any real interest'.

One company seeking distribution rights for the card is Electric Software, specialists in MSX software. Marketing manager Mike Hall, explains the problem: 'In the case of the masked ROM, large quantities would have to be ordered by the software houses and unprotected copies of their new titles would have to be shipped to Japan for manufacture.

'When the EPROMs become available, the situation will be different. They can be blown in this country in the quantities required by the software houses themselves. In a week or less their new games could be appearing on the shelves in a week or less, instead of eight weeks it would take for masked ROMs to come back from Japan.'

If nothing else the cards are controversial. We could see them appearing in everyday life as cashcard replacements. They could easily store your credit level and be used in shops, telephone kiosks or even as international passports, as well as being computer peripherals. Whether they will take over as the new shape of MSX software is another matter. The argument hinges on price — being cheap and effective the cards should catch on, but will the British software market lose through overcautiousness? Only time will tell.

Storage

MSX

Business Sense

Who is to supply the applications you need for your MSX? Jo Stork provides some guidelines

Most of us who have worked in computing for many years feel that MSX offers the home micro user three major advantages over its competition. Firstly it is an essential advance in standardisation. Secondly, even as a first stage, it provides many facilities which are of genuine merit. Finally, these facilities are in the main extremely easy to use.

When MSX was launched, it was at least 30% too costly. Prices are now reaching more sensible levels, and it can not be long before we stop paying for disk drives as if they were made of solid platinum. Add the fact that there is an increasing quantity of business software which is reliable, functional and user friendly, and the cost/benefit ratio of running serious applications on MSX becomes more attractive each month.

Now for the bad news. Many of you will have purchased your MSX from a chain store which makes most of its profit by selling Hi-Fi or videos. You are in danger of finding a salesman whose knowledge is limited either to the latest blockbuster game or to some other make of home micro.

Whether you are relying on salesmen, friends, specialists or your own skills, you have to discover whether the person who will write your software is capable of the task. I will assume that your shortlist of candidates only includes those with whom you are prepared to be totally candid.

What is an expert?

To classify as an expert, the individual must first and foremost have practical experience. The subject in which this experience lies must also be 100% appropriate to the commercial area in which you require knowledge.

The problem arises for all of us that the people with this degree of experience charge more for a day of their time, than you paid for your MSX processor. In all probability you are therefore going to go DIY.

Providing your application is not too exotic, you should be able to find someone with the knowledge required. There are four essential areas where the software's creator must satisfy you. These are in descending order of priority:

1 The business area which the software must address.
2 The language it will be written in.
3 The hardware it will run on.
4 The special requirements of the user.

These four key elements apply whether you wish to write the software for yourself, are searching for someone to do the job for you or just need to turn to someone for an occasional piece of advice.

Let us now look at each in turn, and discover why I have ranked them as I have. With a different computer, this order might well have been rather different.

The business area

Let us assume that you require a simple money in/out recording program. It is obviously essential that the software's creator understands which items should be posted to debits and which to credits. Have I lost you? If the answer is, 'yes' than all I can say is, 'Good.' You have discovered that you need to ask some questions. You could well still find that you are capable of writing the software yourself.

The way to find the person whose answers are reliable is by asking direct questions. Ask a salesman a general question such as, 'Can the package do debits and credits?' and you may well get nothing but a sales pitch. Rephrase it so that you ask 'How does the Package organise debits and credits?' and you could be pleasantly surprised by the depth of knowledge this unearths.

When you have found someone you can trust with your confidence, or else you believe that you youself pass this test, then we move to stage 2.

The language

This is of lesser importance, because MSX can be driven perfectly adequately using its powerful and simple BASIC. True, the assembler will be slicker, but many applications do not need this extra speed.

Where good MSX programmers have the advantage is that they are likely to make more efficient use of memory. This is particularly important if you still have a tape based system, and

have to transfer your files into RAM for processing. An extra 500 bytes saved may be an extra 10 records which can be manipulated without laborious shunting on and off tape. In other words competence in the language is a useful asset, but a candidate who is slightly weak in this area should not be ruled out, given expertise in the business requirement.

Programming weakness is less critical if you are writing the program for your sole use and are not expecting others to operate the system. If you have to endure a few idiosyncracies in the data entry, due to an inability to use one of the more obscure features of the language, then so be it. This need not be a reason for giving up, or paying good money to an outsider. With a little practice, you will forget the quirks. Providing the testing is rigorous and proves the programs are reliable, minor shortcomings can be removed later.

The machine

MSX really comes to the top in this area. Thanks to the standard, any MSX approved device links with no trouble to any other. If your chosen expert has stood up to your close questioning so far, he should never flounder with MSX. Hence this is third ranked. Nonetheless the familiar principles should be maintained.

Aim a direct request such as 'Show me' at the salesman or advisor. If there are occasional glitches in the demonstration, do not be over-critical. More important is to observe how these fumbles are handled. A salesman can also pass this test by stating honestly that he does not have the answer, but will find it for you — so long as he keeps this promise.

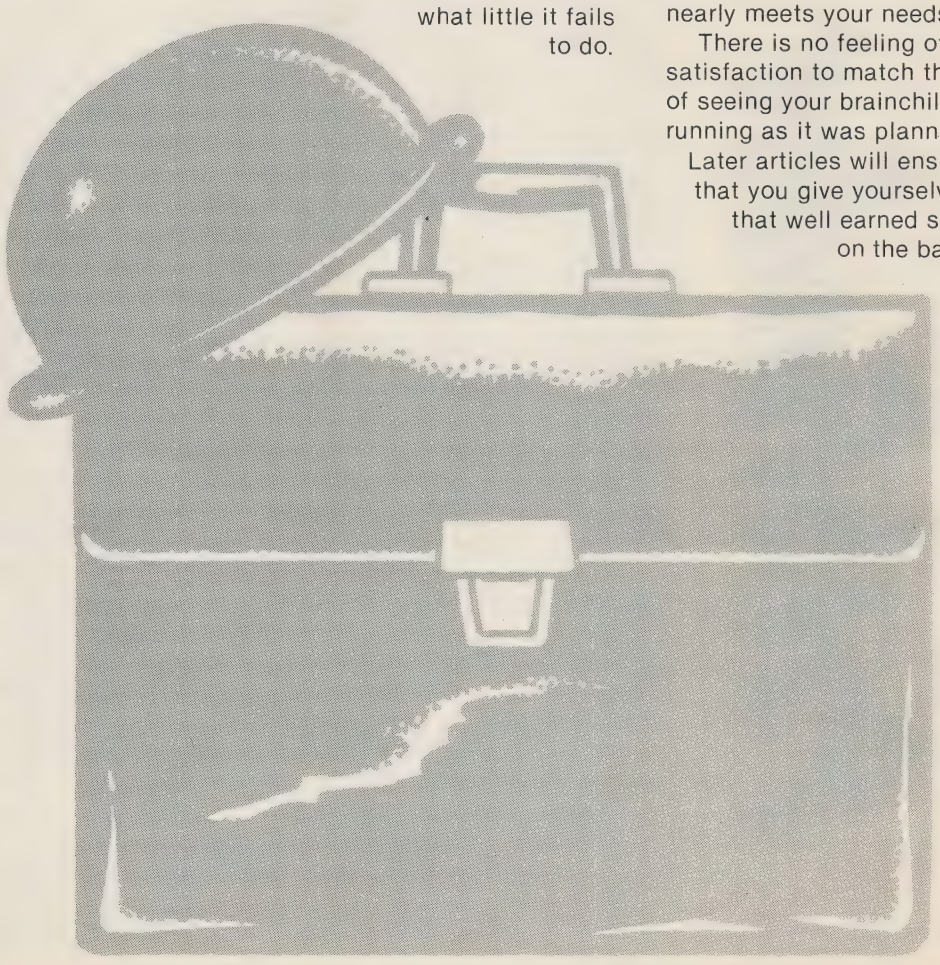
Special requirements

If you can get 95% of your task done simply, reliably and efficiently, then don't become too concerned about the remaining 5% of your system. The cost/benefit ratio of achieving these last few features may well not be worth it.

This is the basis on which most software packages are founded. A couple of years ago the business packages for home micros were usually dreadful. This situation is changing rapidly. The list of business packages for MSX is growing, and the quality is rising fast.

Before you opt for the laborious route of generating your own programs, or seeking someone to provide you with a highly individualistic piece of software, think closely about using a package. Ask for a demonstration, or find someone independent to advise you. Only if you have serious misgivings about the facilities offered should you consider obtaining tailor-made software.

Let me give you a direct example from my own MSX experience. These articles are written using the **Tasword** word processor. There are two features which it lacks and which I would have liked, plus another which I find occasionally irritating. Nonetheless in three months of quite heavy usage, it has done all I needed and never let me down. I therefore judge it extremely highly, because of what it does do, and in spite of what little it fails to do.



Conclusions

MSX is well on the way to making this whole vexed topic a thing of the past. Programming, if you need to do it yourself, is straightforward. The hardware is proving reliable and fits together easily. Software packages are becoming available and improving all the time.

In my experience, I have found that home micro users usually know their application area more thoroughly than they give themselves credit for. They are as likely to get into difficulty conveying the requirements to a third party as they are in doing the work themselves. What is more, they are the ones who know the special requirements better than anybody. I therefore strongly suggest you either consider writing your own software or look for the package which most nearly meets your needs.

There is no feeling of satisfaction to match that of seeing your brainchild running as it was planned. Later articles will ensure that you give yourselves that well earned slap on the back.

Pathfinder

Steve Lucas sheds light on an MSX maze and other puzzles

If you rushed out to buy the superb MSX version by Level 9 Computing of **Colossal Adventure** which we reviewed a couple of months ago, you will, by now, be deep within the caves and will have found at least one of the mazes.

After exploring the caves for some while, your lamp will be getting dim and, armed with some coins, you will need to enter the maze to find the vending machine to get new batteries for your lamp. Then just when you think you are doing well and collecting the treasures, along comes the pirate and takes them all off to hide them in his chest deep in the pirate's maze.

In both cases, you will have to find your way through a maze and this is not an easy task until you know how to do it.

The most logical way of finding your way through a maze is to make sure that you are carrying as many objects as possible when entering it, and then each time you enter a new room drop one of them. In this way, you will be able to recognise that location again even though its description will be exactly the same. Each move you make should be charted on paper as you progress, making a careful note of objects you come across on your journey. Although doing this in the form of a map may seem to be the most logical approach, you are more likely to end up with such a complex diagram that it is almost impossible to follow.

What you are looking for, in a sense, is a password made up of the letters n,s,e,w,u and d, the normal directions of movement, but of unknown length or mixture. Once you know the exact combination of moves, you can move through the maze in suprisingly few turns, which does of course help your lamp to stay lit.

Finding this password is, however, going to take some time and requires a great deal of patience. In the original version of Colossal Caves, written by Crowther and Woods for a large mainframe computer, players were allowed to carry just enough objects to chart their way through the pirate's maze in the way way described above. In the Level 9 version, however, the player is rather more restricted. With only four objects, it becomes that much more difficult to find your way through.

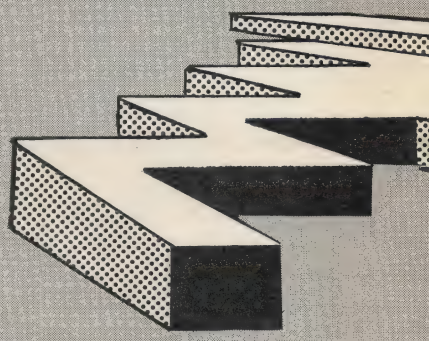
Level 9 estimate that it will take the average player about four weeks to solve the mystery, but in my opinion, it will take even an experienced adventurer far longer because, in most cases, you never have the chance to play an adventure uninterrupted. Just when you are getting to grips with a problem, the phone rings or there's a power cut and it's back to reality with a bang.

Where the Level 9 version differs most from the original is in the ending. Just as you think you've found all the treasures, the caverns close and water starts pouring in. Can you find your way through yet another maze before you drown? With less time for exploration, due to the water, and a limit of only four objects, finding your way through this puzzle will, to some extent, be a matter of luck rather than skill.

When I reached this point, I cheated, and saved the game on tape as soon as the caves closed and again every few moves. This is when you really wish you had a disk drive, for it takes rather a long time to save a game on tape, but it's still quicker than starting from the beginning all over again.

On a totally different topic, how many of you have bought a computer for the kids believing it to be highly educational, only to find that the quality of educational software is, on the whole, incredibly poor? That is if you can find any in the first place.

I know of many parents



who have been persuaded by their offspring to buy a computer on the grounds of education and have been sorely disappointed. You may be surprised to learn that there is probably more educational value in the average adventure game than even some of the best so-called educational programs.

Much research is going on at the moment into writing adventures which are specifically educational, but even the traditional games, like Colossal Caves, have much to recommend them. A good quality game like this will have a high standard of text, which encourages careful reading and, if the plot is exciting enough, even the most reluctant pupils have been known to get involved.

Another skill which can be encouraged by an adventure game is that of map drawing. It is almost impossible to solve a really complex game without drawing a map. The biggest area of interest, however, is in games where the solution to the problems requires specific knowledge. Over the next few years, we are likely to see many adventures based on historical facts or which require a knowledge of chemical formulae.

The possibilities are endless and many teachers and parents are beginning to wake up to the idea that a good adventure game can provide far more incentive to learn than conventional educational programs.

All the adventures written by Level 9 contain vast numbers of locations and objects, but even more impressive is the way in which they have managed to achieve a very high standard of description in the text. In order to do this, Level 9 have used a special language called A-CODE, written by Mike Austin. Just how this works, they haven't revealed, but the results are impressive. Despite the fact that the original version of Colossal Caves required a massive 120K plus disc drives, the messages on screen are almost identical in both versions.

Other codes used in adventure writing rely heavily on the redundancy of letter and word association and it seems likely that A-CODE uses the same techniques. It is a fact that over a quarter of English text is written using just ten words — the, I, is, it, that, in, a, to, and, of. In addition, certain letter combinations always occur together, for instance Q is always followed by U.

If these letter combinations are coded into a single character, the text can be compressed into a far more compact area of memory, thus allowing for a more detailed program. Some codes take this one stage further and replace common groups of letters in words by single characters. Many words contain the following groups of three letters (trigrams) —nce, has, nde, for, ion, ent, tha, and, the— and if these can be replaced by just one character, the saving in memory can be considerable.

The actual way in which A-CODE works is likely to differ in detail from that described above, as many of the codes adopted by other writers of adventures result in very slow response times due to the complexity of decoding the text so that it can be printed onto the screen.

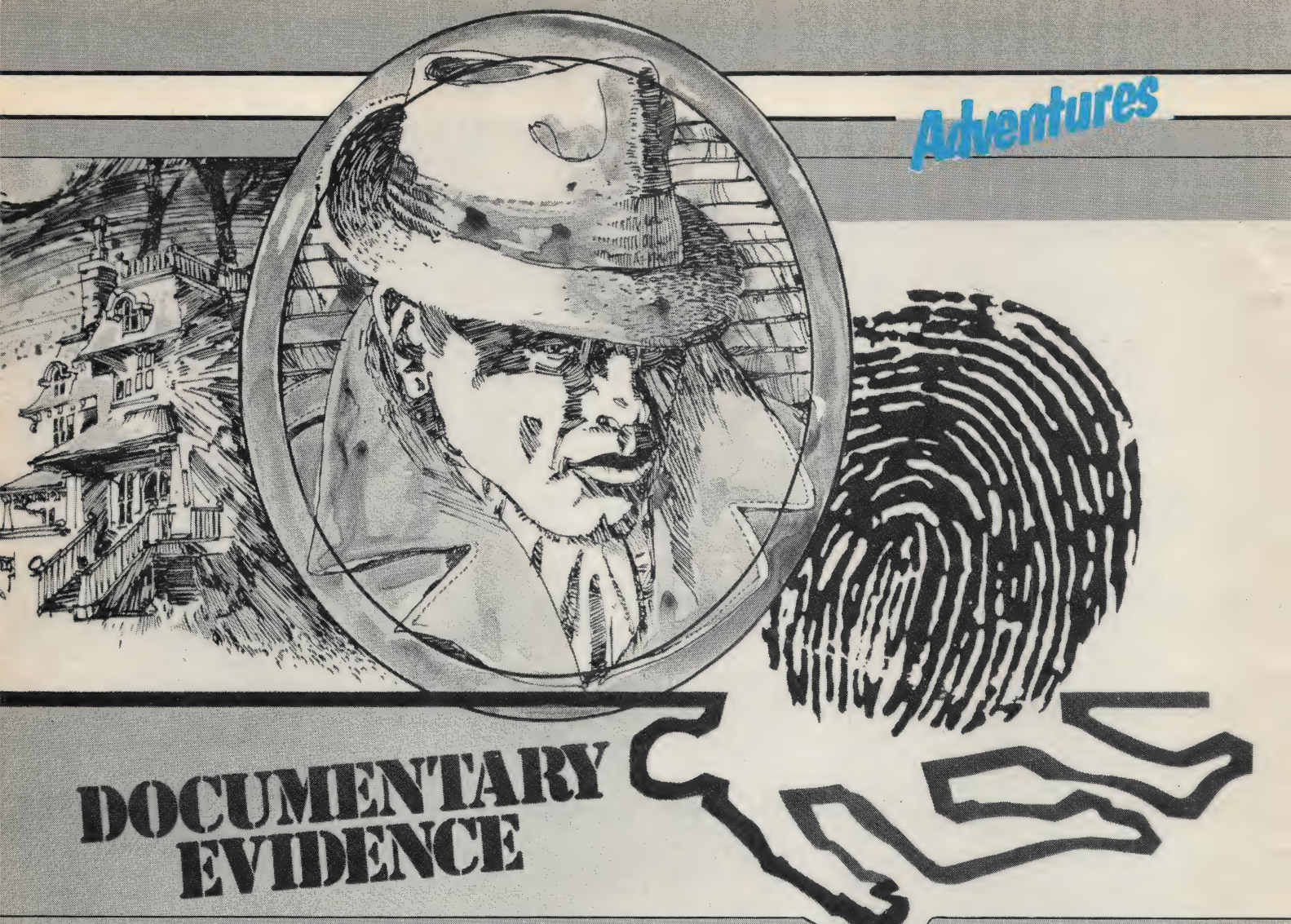
The response time of Level 9 games is very impressive. You don't have to wait seconds for the message to be printed on the screen, as in some other games. One other advantage of A-CODE is that it makes it almost impossible to cheat and solve the adventure by looking at a listing.

Have you ever heard of **Zork?** This is an adventure game available on disk for a large number of American home computers. It is produced by a company called Infocon for Apple, Atari, TRS80, Commodore and CPM. British adventure enthusiasts will, no doubt, be staggered at the price being asked for a copy — over £35 per game — although Commodore have started to sell a version for just under £12.

If sales of MSX machines really do improve, then we may well see a version being marketed in MSX disk format, which is, after all, not too dissimilar from CPM.

Why I am going on about a game which is not, yet, available for MSX? What is so special about Infocom games that justifies such a high price?

The first thing you will notice about a game in this range is that the descriptions of locations and objects make even those from Level 9 look poor. If you know of



DOCUMENTARY EVIDENCE

somebody with a Commodore 64 and disk drive, then do persuade them to buy **Deadline** and let you have a go. Zork is an excellent version of the original adventure, but Deadline is something else.

You are a detective with just 12 hours to investigate an apparent suicide in a room bolted from the inside. What is the meaning of the will which was going to be altered, but wasn't and the household with something to hide?

The suspects are characters who will hold sensible conversations with you, a remarkable achievement in any adventure. They speak and react in different ways depending on the situation, the questions asked and the stage of the investigations. The realism of this game is enhanced even more by the fact that these characters continue to live out their lives even when you are not present.

It seems to be an open and shut case of suicide, but is it? Among your suspects are the efficient business partner, the old housekeeper who is a gossip, the suspicious gardener with the short temper and an aggressive son. At your side is the trusty Sergeant Duffy, who will take any suspicious objects back to the laboratory for investigation and report back later with the results.

During the course of the game, the characters will roam around the house and you can stop them at anytime to have a conversation. Remember, of course, that they may not be telling the truth. Whom can you trust? You may like to question one suspect about another and if someone seems a little uneasy, you may try to find out why.

When you think you have enough evidence, you can get Sergeant Duffy to make an arrest and, after the court sitting, the grand jury will tell you of the decision. Should you fail to secure a conviction, your superiors will tell you where you went wrong.

There are many possible endings to this game and it is, without doubt, the most sophisticated adventure I have yet seen. The standard of description and the response of the characters is so realistic that it seems almost like real life. it is certainly the most gripping adventure available for any home computer.

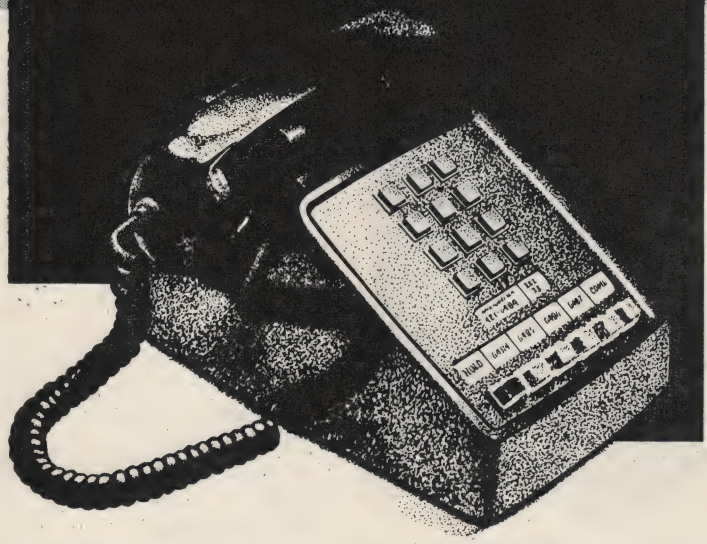
The only trouble is that it is not yet available for MSX machines and we, the owners, must try to do something to get this rectified. The unfortunate thing about the Commodore version, which I have played, is that the disk drive is slow, so that every time you move to a new location, you have to wait too long for the descriptions to be loaded from disc.

MSX disk drives are far superior to their Commodore equivalent and an MSX version would not suffer from this. There have been many rumours of an Amstrad version, which uses CPM, but on 3" drives, so why not MSX? For that matter, why not MSX versions of the games by Epic, Adventure International and Mosaic, to name but a few?

Until more people demand these games, the situation is unlikely to change. In another six months I will have solved the Level 9 games and will have no new challenge. So a plea to the big software houses . . . please let's have more MSX adventures.

Widening Net

In part 2 of his survey, Karl Dallas looks at interfaces, bulletin boards and other wonders of the wired society.



When we put a first, tentative toe into the water of COMMS — that's *communications* to you and me — in last month's article, we found it was quite comfy, thank you. We took a look at Prestel and Telecom Gold, learnt the difference between an acoustic coupler and a hard-wired modem, and looked into the Computermates combined RS232 interface and ROM-based COMMS software.

Since then, Basil Lane, eminence grise behind MSX-Net, has decided to extend a free year's membership to purchasers of the Computermates interface — he already makes a similar offer to people buying one from Kuma or Toshiba. Computermates' Geoffrey Paterson, for his part, has decided to also make his software available on tape and disk, so it can be used with the other interfaces if people prefer.

But what is an interface, anyway?

Interfaces

Most COMMS use a standard called RS232 — actually, it is one of the most infuriatingly non-standard standards you'll come across, as far as wiring is concerned, but we've just got to live with it. If you search your MSX sockets and connectors, you'll look in vain for one with that label.

But that is what interfaces were made for — to translate the eight-wire parallel signals inside your computer (such as are used to drive a parallel printer like the MSX printers) into the *serial* signals that can go down the two or four-wire cabling of the telephone system.

Obviously, this slows things down somewhat, as the eight-wire signals have to queue up to get into the telephone, rather like people being told to walk not run to the exits in a cinema that's caught fire, but it can't be helped. Blame our antiquated telephone system, not MSX.

The good news about the MSX interfaces is (a) it has a standard D-socket (unlike the BBC, say, which has one that's only too easy to put in upside down) and (b) it contains some very handy built-in routines that make it much easier to use.

There are nine new Basic statements in ROM, all usable with the CALL prefix:

COMINI
COMTERM
COMDTR
COMBREAK
COMSTAT
COM GOSUB
COMON
COMOFF
COMSTOP

In addition, the following Basic commands and statements can be applied to the RS232 port:

SAVE
LOAD
RUN
MERGE
OPEN
CLOSE
PRINT#
PRINT#USING
INPUT#
LINE INPUT#

Before using either of the two MSX standard interfaces, they must be initialised, setting the baud rate at which they will operate (this will be governed by the type of modem you are using or the baud rate of the host computer you are

logging on to, or both). The following three-line program will do this:

```
10 CLS:KEYOFF:WIDTH
 40  20 CALL COMINI
("0:7E1XNNNS",
120 0,75,0): REM sets
baud rate and other
protocols 30 CALL
COMTERM(0:"): REM
selects terminal mode
```

Line 10 will be self-explanatory. Line 20 is the heart of the program, and can be changed if different protocols are needed; the heart of this line is the alphanumeric string, "7E1XNNNS", which the computer interprets as:

7-bit character length
Even parity check
1 stop bit
XON/XOFF enabled
CS control disabled
Auto-linefeed disabled
on receive but enabled on send

The figures following the quoted string refer to the baud rate, and in this example set the interface to 1200/75 baud, meaning that the host computer will send to you at 1200 baud, and you will send to it at 75 baud. This is a more common protocol in UK than in many other countries, notably USA, where 300/300 or even 1200/1200 is more common. The MSX interface can actually handle up to 14 different baud rates, from an ultra-slow 50 baud to very fast 19,200 baud.

The advantage of faster baud rates is obviously that you spend less time connected to do what you want, but the faster your baud rate, the more prone it is to error. If 1200/1200 is supported, this is probably best, though you will actually find 1200/75 and 300/300 more usual in this country.

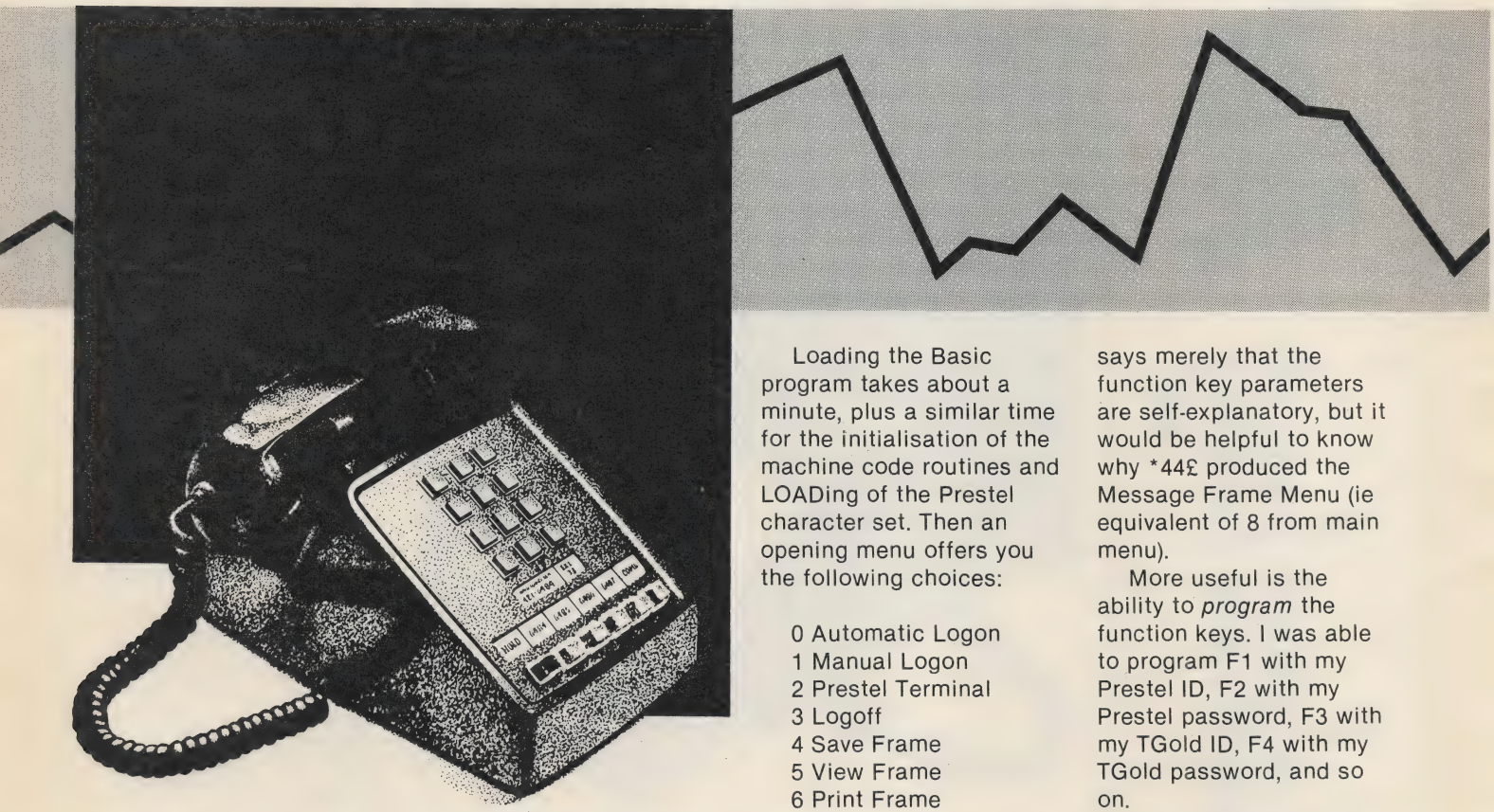
Prestel and all other viewdata systems operate on 1200/75 (though there is a text-only Prestel service at 300/300), Telecom Gold operates at both speeds, and most bulletin boards operate at 300/300.

I have SAVEd two versions of this program: the one above is called "MOD1275", and a slightly different version called "MOD300" has the following modification to line 20:

```
20 CALL COMINI
("0:7E1XNNNS",300,300,0)
:REM sets baud rate and
other protocols
```

Kuma package

Recently, I was able to take a look at the Kuma RS232 interface, which costs £99.95 plus £19.95 for the cassette-based software.



Loading the Basic program takes about a minute, plus a similar time for the initialisation of the machine code routines and LOADing of the Prestel character set. Then an opening menu offers you the following choices:

0 Automatic Logon
1 Manual Logon
2 Prestel Terminal
3 Logoff
4 Save Frame
5 View Frame
6 Print Frame
7 Downloader
8 Mailbox Message
9 Set Parameters
ESC Exit

To use the first, you have to LOAD the program into memory, LIST line 1010, and insert the appropriate number. If, like me, you find it easier to get on to TGold via their 300 baud 01-583 3000 number rather than the 1200/75 baud 01-583 1275 number, changing the parameters is simplicity itself. Just press 9 and you're offered a sub-menu:

0 Tranmit Baud Rate
1 Receive Baud Rate
2 Cursor Character
3 Cursor Blink Rate
4 Display Function Keys
5 Set Function Key
6 Set Colour
7 Display TAB settings
ESC Return

The function keys duplicate certain of the main menu controls, and generate a code beginning with an asterisk and finishing with a hash (actually shown on screen as a £ sign, which is confusing). The manual says merely that the function key parameters are self-explanatory, but it would be helpful to know why *44£ produced the Message Frame Menu (ie equivalent of 8 from main menu).

More useful is the ability to *program* the function keys. I was able to program F1 with my Prestel ID, F2 with my Prestel password, F3 with my TGold ID, F4 with my TGold password, and so on.

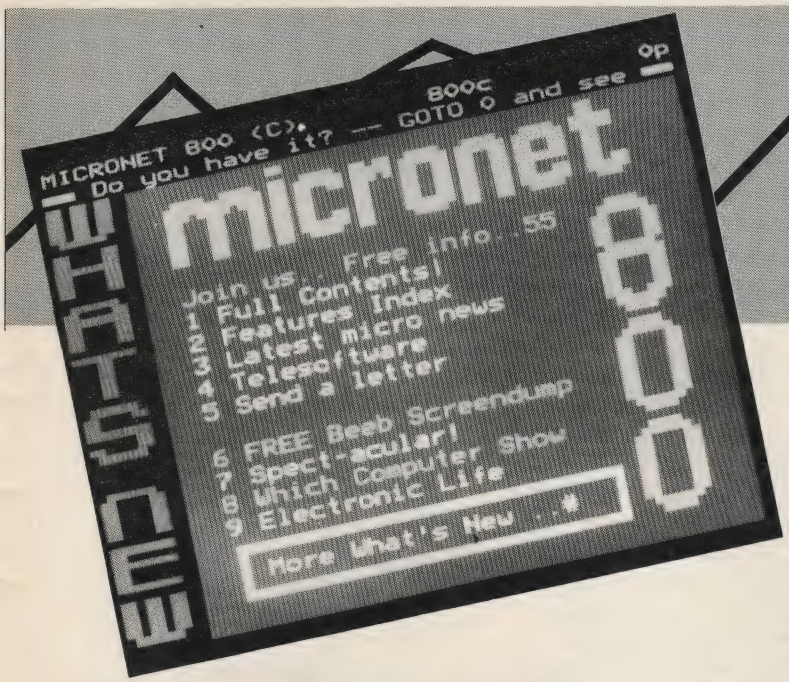
TAB is used to store screens as pages in RAM or to display them: TAB followed by capitals from A to Z, the currently displayed page, is stored. TAB followed by lower-case letters from a to z displays the stored page. However, you can only store 15 screens not 26.

Of course, you lose the pages if you turn the computer off, but they can be SAVEd on to tape.

I found this like most Kuma software: serviceable, a little clumsy in its operation, but fairly fault-free.

The manual isn't a patch on the Toshiba book, which is worth having even without the interface it supports, and the Kuma documentation on their interface is strictly for the dedicated ML programmer. I notice, however, that it says: 'Provision is made on the board for up to 16k of "sideways" EPROM/ROM (2764/27129 type) at memory page 2. This facility can be used to extend Basic when the final 'COM:' specification is released by ASCII-Microsoft.'

Sounds interesting.



Bulletin boards

To the true hacker, of course, this is all very interesting, but it is not the main name of the game, because it all costs money. After you have bought the necessary hardware, you want to get around the wired society at the minimum of expense, right? Apart from telephone bills, which seem to be unavoidable.

The answer to this desire — and it is quite legal, I assure you — is the Bulletin Board. The BB (as we shall refer to it from now on) is something of a public service on the part of the hacking fraternity.

It is a privately run database, run by hackers for hackers, often on a 24-hours-a-day basis, which you can log on, read, leave messages for others to read, and so on. The public viewdata services, like Prestel, attempt to provide this sort of service with facilities like Chatline, but they don't have the same sort of 'alternative' ring about them.

BBs originated in the US, and because of this a large number of them run on 300/300 baud, but since Prestel has established a large user base in this country of people with dedicated 1200/75 baud modems, an increasing number are becoming available at that speed, too. Most of them are produced by people with a special interest in specific computers, Tandy, Apple and so on, but that doesn't mean that people with only that kit can get on to them. No, anyone who is interested, and who has the right equipment can do that.

At this moment, there are no MSX specialist BBs, but that can only be a matter of time. Meanwhile, if you ring 0225-23276 between 9pm and 11.59pm weekdays, 9pm to 9am weekends, you'll be able to talk to Mark Templeman about Atari. If Apple is your bag, then Tony Game on 0394-276306, Quenton Reidford on 0742-667983, or Mike Jones on 0268-776956 can help you.

If you relish playing Multi-User Dungeons (MUD to you), then you'd better communicate with Wizard Paysul, known to the authorities as Paul Smith, who has a 24-hour BB running on 0827-288810. Lovers of the more (comparatively) prosaic sport of adventure gaming might like to chat over their addiction with Paul Beaumont on 01-341 7840. This is a 1200/75 baud bulletin board by the way; all the others listed are 300/300.

Everything to do with entertainment is covered by Mike Parker on a 24-hours-a-day basis on 04862-25174. A rather more serious BB is the medical enquiry service, Clinical Notes on Line, run by Mike Buckingham on 0524-60399.

If you're a peacenik or ecologist, try Communitree Hope, run by Lynn Hurd on 0874-711147.

You may have difficulty getting on. Your first problem could be that, if you are calling them at a popular time (evenings or weekends) you may find them engaged. Solution: try an *unpopular* time, like three in the morning. If the number rings but nothing happens after that, then check that you are using the right baud rate. (We don't claim to be infallible, so it could be worth trying

1200/75 if you're set to 300/300, or vice versa.)

If the baud rate is correct, then the protocols you're using are probably wrong. Most will use either 7 bits, no parity and one stop bit, or 8 bits, even parity and one stop bit, but it is worth trying the entire range of options, which consists of:

7 bits no parity 1 stop bit
7 bits odd parity 1 stop bit
7 bits even parity 1 stop bit
7 bits no parity 2 stop bits
7 bits odd parity 2 stop bits
7 bits even parity 2 stop bit
8 bits no parity 1 stop bit
8 bits odd parity 1 stop bit
8 bits even parity 1 stop bits
8 bits no parity 2 stop bits
8 bits odd parity 2 stop bits
8 bits even parity 2 stop bits

Some BBs are 'ring-back', meaning that you ring first, then ring off, then ring again and you get through. If you ring out of hours (on a non-24-hour service), you may be able to get the Sysop ('system operator') to find out the protocols.

By the way, there are some public viewdata bulletin boards which are also free. In addition to VISA, the Communitel board I told you about last month (tel: 01-958 7098, to save you looking it up), there is also C-View (0702-546373), the London Borough of Hackney (01-985 3322), the Open University's Optel (01-794 0611, 0908-71188, 0912-850131), and Aberdeen ITEC (0224-641585).

You won't need a password for any of these, except OPTEL, where 000000000 (nine zeros) followed by the password PUB will get you on.

Professional databases

Strictly speaking, everything you've been looking at so far is a database, but for the person with more money than most of us, there are the really professional services, which can cost you £50 or more an hour.

World Reporter is an electronic cutting service. It allows you to search for the full text of anything that has appeared in recent years in the Guardian, the Economist, the Financial Times, the AP teleprinter wires, or the BBC world news service, and to pull it out onto your screen.

Knowledge Index is actually a sub-set of the much vaster **Dialog** database but rather cheaper, since it can only be accessed evenings and weekends. It costs £25 to join plus $24 an hour, and you can actually read the entire text of the Encyclopedia Americana and check references in 25 or so other databases (Dialog Information Services, PO Box 8, Abingdon, Oxford, OX13 6EG, tel: 0865-730969).

Blaise, a British Library service, is available for an initial fee of £45 plus £27 a year. Pricy though this is, it is not a lot if you are the sort of researcher who would otherwise be spending pounds on travelling to and from the British Museum (2 Sheraton St, London W1V 4BH,tel: 01-636 1544.)

The Source is probably the largest database of its kind (and American, of course), with some 40 million pages of data available on line. The cost is a sign-on price of about £50 and a connect-time charge of between £10 and £25 an hour, depending on when you use it and the dollar/sterling exchange rate (1616 Anderson Rd, McLean, Virginia 22120, USA. Tel: 010-1-703-734 7500).

Blaise, the Source and the BBC bit of World Reporter are likely to be available via TGold later this year. MSX-Net's Basil Lane was planning to include them on his service, but he has persuaded the Telecom high-ups to make them available more generally — though they will also be available via MSX-Net.

If you can't wait until then, you could access them direct, but to do that you will need to go via Telecom's PSS network unless you have a Bell Telephone modem, which it is illegal to connect to the phone lines in Britain. PSS is useful (you can also get into MUD) and it only costs about £7 a quarter (plus connect-time charges). You can get details from Packet Switch-Stream, Customer Service Group, 1-6 Finsbury Circus, London EC2M 7LY, tel: 01-920 0661.

All this is big-time stuff, and the necessary hardware will set you back between £100 and £200. That is on top of the cost of your MSX computer of course.

But once you've got wired, you'll never want to disconnect again. I can guarantee that.

Buzz-words part 2

GLOSSARY

Easylink

Cable & Wireless **electronic mail** service, especially handy for sending TELEX messages. No storage facility for messages after they've been read, though.

Echo

A repeat back to your screen of everything you type in the host computer. Most databases do it automatically, which is why you sometimes have to turn it off, or you get results Iliikkee tthhiiss! You'll need echo if you are working in half **duplex.**

Electronic Desk

A package consisting of MSX computer, cartridge-based word processing/comms/card index software with built-in RS232C, Thorn-EMI auto-dial modem, disk drive and green-screen monitor. It can access up to 12 different database systems and also dial up any name from the card index. It's neat.

Electronic mail

Means of sending messages to other subscribing computers: systems available in UK include **Telecom Gold** (part of the world-wide Dialcom network), **Envoy, Easylink** and **One-to-One. Prestel** also has mailbox facilities. Nearly four million Mailbox messages were sent via Prestel last year.

Emulate

A way of fooling a host computer into thinking you are the same sort of computer, eg pretending to be a DEC VT100 or IBM 3278. Most public-access computer databases don't care what you are, as long as you use the appropriate protocol.

Envoy

Unusual electronic mail system, in that it's alphamosaic rather than text-only (like Telecom Gold), and subscribers can easily produce their own teletext-style screens mixing text and graphics. It costs 10p a minute (no cut-rate for off-peak time) but there is no storage charge. Subscription comes free to users of Electronic Desk.

FDX

Abbreviation for full Duplex.

Hacker

Misused these days as a term of abuse for any unauthorised person who breaks into a computer system, but really it should be the micro equivalent of a radio ham, just a keen amateur who knows his/her way around.

Handshake

What computers, like people, do before they communicate. Sometimes you will need a special kind of handshake signal to the receiving computer. You have to know if your computer (or the host) needs it. Most don't.

HDX

Abbreviation for half Duplex, meaning that each computer takes it in turn, very politely, to speak. Thus it is slower than full duplex (FDX).

Homelink

Electronic building society, operated on Prestel by the Nottingham, allowing members to use all its services, including a new 'telebroking' service for those who want to play the stock market, and all from their home micro (provided free by the society). See it on *444

Host

When you call up a database, you are a guest of the big computer, and so the big one is the host.

ID

Short for IDentification. You have to type this in (or get your computer to do it for you) during LOG-ON procedure. Otherwise they wouldn't know if you were authorised to use it, would they. Hackers love trying to break into computers using a phony — or 'borrowed' — ID. See also **password.**

IP

Abbreviation for Information Provider, the people who put the information into the database in the first place. Usually, it costs them a bit to do so, and so they charge you in return. Some rent spare screens to third parties, known as sub-IPs.

LAN

Abbreviation for Local Area Network.

LOGON

The process of telling a computer who you are, usually by keying in an ID or password. If what you type doesn't match what it is expecting, it usually hangs up on you.

Modem

Abbreviation for MODulator/DEModulator, the box that sits between

GLOSSARY

the computer and the telephone line. It translates its digital output into analogue signals which can travel over cables intended for sound-originated signals.

MSX-NET

A closed users' group within Telecom Gold, costing ordinary subscribers £10 a year, or free if they buy one of the MSX modems. Pros like me have to pay £75 a year, which I reckon is really unfair.

MUD

Abbreviation for Multi-User Dungeons, a network adventure game originally devised by Essex University lecturer Richard Bartle and programmer Roy Trubshaw, running on a DEC 10 and most easily accessible via COMPUNET. There are now plans for a MUD-type game on Prestel.

Network

Strictly-speaking, any system of inter-connections, hence the British Telecom network. Used in the micro world for groups of computers linked together to share some kind of common facility, like a printer, hard disk, or floppy disk, or to interchange data. Everyone says this is going to be The Next Big Thing.

One-to-One

Electronic mail service, includes radio paging and (in London) courier service in addition to regular EMail and telex.

Oracle

ITV's teletext service, looking a bit like Prestel on the screen, but it's tranmitted between the frames of regular TV pictures, and is free. It doesn't require any phone connection. Some teletext adaptors for computers are available, though generally it's seen on a TV set, with adaptor, which is built-in on the largest models.

PAD

Abbreviation for Packet Assembler/Disassembler. You'll come across it mostly as the opening prompt when signing on to PSS or Telecom Gold.

Parity

A means of checking whether what one computer receives is what the other transmitted, by adding an extra bit on each byte to indicate whether it should have had an odd or even number of ones in its bit-pattern. Hence, you can have odd, even or no parity. It is estimated that there is one chance in a million of a transmission error. Line or ambient noise can also garble transmission, but parity-checking won't help you with that.

Password

A double check on your identity, to make sure someone else isn't getting access to the computer in your name (and at your expense). You should be able to change your password and should do so frequently.

Patric

Irish videotex service, with over 50,000 reference sources (no, really).

Photo Videotex

It should have been working by now, but it has been held back by our antiquated telephone exchange system. It is a high definition full-colour photo transmission system that'll make Prestel graphics look really sick. But not yet.

Prestel

A great idea that is still waiting to take off, though **Micronet 800** has helped to make it more popular. It is a hugh database with 330,000 frames of information stored, and 52,000 terminals attached. Of these, about 14,000 are members of the Micronet 800 closed user group for micro owners, who have exclusive access to between 30,000-40,000 screens, including **telesoftware.** The full alphamosaic text-plus-graphics screen is 1200/75 baud, but there is a 300/300 baud text-only line which substitutes asterisks for the graphics, and is rather faster.

Protocol

The way in which two computers communicate. For instance, to talk to Telecom Gold, your computer needs to be set up for 7-bit character, 1 stop bit, even parity, xon/xoff handshake.

PSS

Abbreviation for Packet Switch-Stream — a rather clever way of keeping your telephone bills down, especially when you are accessing computers a long way away, eg in USA. It allows several people to use the same phone line, by cutting up their data transmission into little chunks, or packets, and squirting them down the line, one after the another. Every time you pause between keystrokes, what you have done so far is sent down, and when that is done someone else grabs the line, and so on. Sorting it all out at the other end must be quite a job, but they manage it. It cuts costs down to the price of a local call, plus 2½p a minute, which beats transatlantic phone costs any day.

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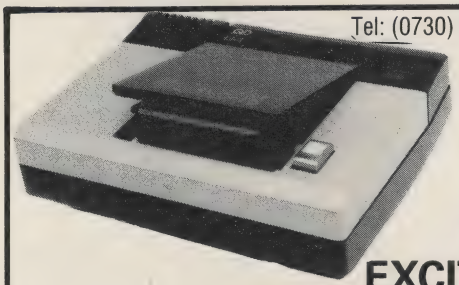

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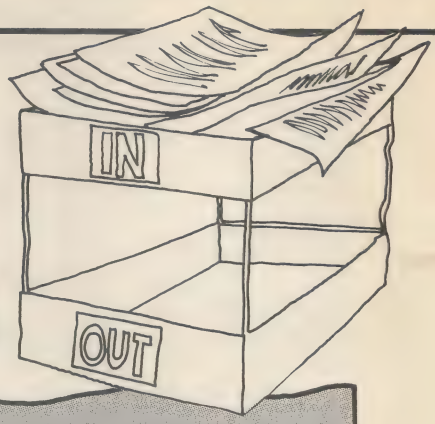


Part 4 of Bob Maunder's series shows you how to get your club records into print

In previous episodes of this series we have followed the stalwart club secretary in creating records of members, amending them and even deleting them. We have seen his industrious selection and sorting of member details and his decisions on screen formatting. However in spite of all the high technology, he is still lumbered with copying out the results from the screen with humble pen and paper. Clearly this unacceptable situation cannot be allowed to continue a moment longer, so let's see how to get things printed out.

We will aim to produce a program which can manipulate the members file on tape to produce three possible outputs on the printer:

1. A full membership list.
2. Name and address labels.
3. A circular letter to all members.

In fact printing and file-handling go hand in hand as two of the most common operations in business computing. Scientific processing does lots of number-crunching with Laplace transforms and matrix inversions scattered liberally around. But in business programs the emphasis is on the input, output and filing of bulk data, with the most complex algebraic operation being adding up.

First we will go into the basics of printer handling with the MSX micro.

The machine has a Centronics printer output, but unfortunately the connector is far from standard. In the early days of MSX poor souls like myself who wanted to use a printer were forced to scrounge around for the technical details of printer pin-outs, then hunt through electronics catalogues for the right connector to plug in at the MSX end, and finally solder the cable and bits together.

Of course the modern MSX owner simply waltzes into the nearest computer hyperstore and buys a complete cable off the shelf. I am convinced that things are made too easy for today's young people, back in my days we...

Anyway, back to printing. Assuming you have a cable linking the micro to the printer, plus a good supply of paper, you are ready to experiment with the MSX BASIC LPRINT statement. We will consider some of the different effects that can be produced, and then use this theory to supplement our club membership system.

In the same way that PRINT is used to output information onto the text screen, so its twin brother LPRINT does the same for the printer. Otherwise the statements are identical in the layouts they produce and the functions that they may include. The keyword is followed by a list of items to be printed, where the items may be constants, data-names or expressions. Numeric values are always printed with a trailing blank, and preceded by a space or negative. Strings are printed left-justified.

Items in a print list may be separated by commas, semicolons, or in some cases nothing. Semicolons cause items to be printed immediately after each other. Commas cause data to be printed in preset fields, each 14 character positions long — these act rather like tab settings on a typewriter. Semicolons may be omitted when separating text constants from other items — this has been done in previous program examples.

The last item in a print list may optionally be followed by a comma or semicolon. This affects where the next item of data to be printed will appear — in the next field for a comma, in the next character position for a semicolon, or on the beginning of the next line if no character is included. An LPRINT statement on its own leaves a blank line — very useful for adding clarity to reports.

Often the preset fields are not suitable for tabular output. Here two print functions come to the rescue, namely TAB and SPC. TAB(n) causes the following item to be printed commencing at column n, leaving blanks up to that point. SPC(n) leaves n spaces from the currect position. Neither TAB nor SPC can be used in statements other than output, but the latter's place is taken by SPACE$ if required in assignments.

The 'USING' clause can be added to LPRINTs to specify exactly how information is to be output and an amazing amount of flexibility for output formatting is provided. The basic principle is that a format control string is specified immediately after 'USING', and this determines how succeeding data items will be displayed.

A format control string is enclosed in quotes, and contains special control symbols. For string data these symbols may be:

! & and /

Using "!" causes only the first character of a string to be printed, so that PRINT USING "!";"HELLO" gives only H.

The "/ /" signs cause a certain number of characters to be printed, determined by the number of spaces between the / symbols, plus two. Hence PRINT USING "/ /";"CANARY" causes

CANA to be printed.

The "&" is used in the middle of a text string and causes all of a string contents to be printed at the point. For example if X$ contains "Tosh", then PRINT USING "Hello /, gotta Toshiba";X$ produces Hello Tosh, gotta Toshiba.

A much larger range of format control symbols can be employed with numeric output. They include:

+ * ^ . – and £

Each "#" in a format control string represents a digit position, and numbers are right-justified within these limits. The decimal point may also be specified, as can the comma symbol typically used for thousands. Signs may be placed at the beginning or end of the control string: a "+" causes explicit printing of the sign, whether positive or negative; whereas "–" only causes the sign to appear if it is negative.

Additionally, asterisks can be output in place of leading blanks, such as for monetary amounts, by the inclusion of a double asterisk at the beginning of the format. To get the currency symbol, use two pound signs if it should immediately precede the digits, or a single pound sign if it is required at the left of the field. Finally, the inclusion of "^^^^" at the end of a format control string gives gives the number in E format.

Any other characters that appear in a format control string will be output as they appear, in their specific positions.

One more piece of printing theory before getting down to business. Many printers support different typefaces and special actions such as going to the top of a new page. These are produced by sending certain reserved character codes to the printer. The actual codes required vary according to the printer being used, but for the Epson MX range the following apply:

FORM FEED	12
UNDERLINE ON	ESC-1
UNDERLINE OFF	ESC-0
ENLARGED ON	ESC W 1
ENLARGED OFF	ESC W 0

There are many other variations for getting effects such as subscripts, bold type and so on, but these are the effects required for our example system. In the table above ESC stands for ESCAPE and can be produced by character code 27.

But how can special character codes be sent to the printer? In fact this is very straightforward — LPRINT CHR$(N) sends code N to the printer, for any N. Hence LPRINT CHR$(12) will cause the Epson to throw a new page. The other sequences just require a string of codes, so that for example:

LPRINT CHR$(27) + "W" + CHR$(1)

switches on the enlarged printing. Many programmers like to define such sequences under a single name at the beginning of the program. You will see this in our listing.

Let's now move on to see what reports our friendly club secretary wants to come out on the printer. We assume that he wants a membership list, some name and address labels and various circular letters. In designing any print-outs we need to give considerable thought to the layout required. This is often best planned using some squared paper of the same grid size as the printer. Typically a printed page has about 60 lines of 80 characters. This is the size that we will work to.

For the membership list we want to show all the data on each member's record. Remember that we stored the following items:

Membership number
3 characters
Title (eg Ms)
4 characters
Forenames
20 characters
Surname 10 characters
Address line 1
20 characters
Address line 2
15 characters
Postcode 10 characters
Telephone number
12 characters
Joining date
6 characters

Now by simple addition, it is not possible to print all three fields on a single line. So on our squared paper we could juggle items around and perhaps end up with a layout like that shown below:

```
Col:    6      10      31          58        67
MNo     Title  Fname   Addline     Joindate  Telno
        Surname        Addline2    Pcode
```

The formats of the address labels and the circular letter can be planned out in a similar way. Example outputs are shown in the figures below.

```
Mr J Blackwell
5 Elswater Close
Stockton
TS12 3RT
1

Mrs E Elliott
5 Wentworth Way
Eaglescliffe
TS23 4TH
2

Mr A Danby
36 West St
Saltburn
TS25 9KH
3

Mr F Roberts
26 Skerne Rd

Mrs N Brown
Glebe Farm
Hilton
NN6 7BC
7

Mr K Walker
89 Ainderby Rd
Northallerton
YO76 9LP
8
```

```
1  Mr John Blackwell      5 Elswater Close Stockton TS12 3RT      120183  43343
2  Mrs Emma Elliott       5 Wentworth Way Eaglescliffe TS23 4TH   020384  312111
3  Mr Alec Danby          36 West St Saltburn TS25 9KH            210482  471230
4  Mr Fred Roberts        26 Skerne Rd Norton TS23 6KM            010678
7  Mrs Nancy Brown        Glebe Farm Hilton NN6 7BC               091183  211132
8  Mr Keith Walker        89 Ainderby Rd Northallerton YO76 9LP   300285  34209
```

The program to produce these reports takes the membership file from cassette, as produced by the programs given in the two previous episodes of this series. It is often easier to handle a couple of smaller programs rather than one monolithic creation. However for readers with a penchant for monoliths, the final episode next month will include a fully documented single program with all the features of the series.

Since the report program works on its own, it does need to borrow a few routines from last month. These occur mainly in the first half of the listing. The three report routines appear in the latter half, and they can easily be modified to suit the reader's needs by using the principles outlined earlier. In particular the circular letter is just one (slightly silly) example of what can be done.

Let's describe the subroutines in detail.

Lines 10-60 . . . Main module. Initialise, load records from tape, sort, give menu and end.

Routine 70 . . . Load member records from tape. Reads 'NO' records from cassette.

Routine 180 . . . Dimension arrays, zeroise counters, set up print control characters.

Routine 270 . . . Split up a member record into its component fields and store in array elements.

Routine 390 . . . Finds the next field in a member record.

Routine 430 . . . Delay.

Routine 460 . . . Sort. Member file is in membership number order by default — this routine allows sorting by surname if required.

```
10 CLEAR 10000:KEY OFF:CLS
20 GOSUB 180 'initialise
30 GOSUB 70 'load records from tape
40 GOSUB 460 'sort
50 GOSUB 650 'print menu
60 STOP
70 REM Load member records from tape
80 LOCATE 5,10:PRINT"Position tape correctly & PLAY"
90 OPEN "members" FOR INPUT AS £1
100 INPUT £1,HI,NO
110 CLS:LOCATE 5,2:PRINT"File opened, "NO"records "
120 LOCATE 0,10:PRINT"Reading";
130 FOR J=1 TO NO
140 LINE INPUT £1,M$:GOSUB 270:PRINT".";
150 NEXT J
160 FOR J=1 TO NO:IND(J)=MN(J):NEXT J
170 PRINT:PRINTNO"records loaded from tape":CLOSE:GOSUB 430:RETURN
180 REM Dimension arrays & zeroise counters
190 DIM MN(100),NT$(100),NF$(100),NS$(100),AS$(100),AT$(100),AP$(100),T$(100),JD
$(100),IND(100)
200 HI=0:NO=0
210 FF$=CHR$(12)
220 U1$=CHR$(27)+"-"+CHR$(1)
230 U0$=CHR$(27)+"-"+CHR$(0)
240 E1$=CHR$(27)+"W"+CHR$(1)
250 E0$=CHR$(27)+"W"+CHR$(0)
260 RETURN
270 REM >>> Split up member rec M$ to Jth array elements
280 P2=0:GOSUB 390
290 MN(J)=VAL(V$)
300 GOSUB 390:NT$(J)=V$
310 GOSUB 390:NF$(J)=V$
320 GOSUB 390:NS$(J)=V$
330 GOSUB 390:AS$(J)=V$
340 GOSUB 390:AT$(J)=V$
350 GOSUB 390:AP$(J)=V$
360 GOSUB 390:T$(J)=V$
370 LM=LEN(M$):IF LM>P2 THEN JD$(J)=RIGHT$(M$,LM-P2) ELSE JD$(J)=""
380 RETURN
390 REM >>>Set V$ to next field in M$
400 P1=P2+1:P2=INSTR(P1,M$,"_")
410 V$=MID$(M$,P1,P2-P1)
420 RETURN
430 REM >>> Delay
440 FOR JJ=1 TO 1000:NEXT
450 RETURN
460 REM Sorting
470 CLS:PRINT TAB(5);"SORTING OF MEMBER RECORDS"
480 LOCATE 5,4:PRINT "1. SORT IN SURNAME ORDER"
490 LOCATE 5,6:PRINT "2. SORT IN MEMBERSHIP NUMBER ORDER"
500 LOCATE 1,10:INPUT "Enter choice (1 or 2)=";SZ
510 SZ=INT(SZ):IF SZ<1 OR SZ>2 THEN 500
520 IF SZ=1 THEN GOSUB 550
530 RETURN
540 REM Exchange sort on IND
550 E=NO-1:LOCATE 1,12:PRINT "Sorting";
560 EX=FALSE:PT=1:PRINT ".";
570 IF NS$(IND(PT))>NS$(IND(PT+1)) THEN SWAP IND(PT),IND(PT+1):EX=TRUE
580 PT=PT+1
590 IF PT<=E THEN 570
600 E=E-1
610 IF (E>=1) AND (EX=TRUE) THEN 560
620 RETURN
630 LOCATE 1,22:INPUT "Press RETURN to continue";Z$
640 CLS:RETURN
650 CLS:PRINT "------CHOICE OF PRINTED REPORTS------"
660 LOCATE 2,3:PRINT "1. Full membership list"
670 LOCATE 2,5:PRINT "2. Name and address labels"
680 LOCATE 2,7:PRINT "3. Circular letter"
690 LOCATE 0,20:INPUT "Enter option required (1-3)";Z
700 Z=INT(Z):IF Z<1 OR Z>3 THEN 690
710 ON Z GOSUB 730,840,1170
720 RETURN
730 FOR J=1 TO NO
740 I=IND(J)
750 GOSUB 780
760 NEXT J
770 RETURN
780 LPRINT STR$(MN(I));TAB(6);NT$(I);TAB(10);NF$(I);TAB(31);AS$(I);
790 LPRINT TAB(58);JD$(I);
800 LPRINT TAB(67);T$(I)
810 LPRINT TAB(6);NS$(I);TAB(31);AT$(I);" ";AP$(I)
```

```
820 LPRINT
830 RETURN
840 REM Name and address labels
850 J=1:LC=1
860 GOSUB 930
870 J=J+1:LC=LC+1
880 IF J>NO THEN GOSUB 1010:RETURN
890 IF LC<=3 THEN GOTO 860
900 GOSUB 1010
910 LC=1
920 GOTO 860
930 I=IND(J)
940 IF LC=1 THEN GOSUB 1090
950 LA$(LC)=NT$(I)+" "+LEFT$(NF$(I),1)+" "+NS$(I)
960 LB$(LC)=AS$(I)
970 LC$(LC)=AT$(I)
980 LD$(LC)=AP$(I)
990 LE$(LC)=STRING$(15," ")+STR$(MN(I))
1000 RETURN
1010 LPRINT
1020 LPRINT TAB(3);LA$(1);TAB(27);LA$(2);TAB(51);LA$(3)
1030 LPRINT TAB(3);LB$(1);TAB(27);LB$(2);TAB(51);LB$(3)
1040 LPRINT TAB(3);LC$(1);TAB(27);LC$(2);TAB(51);LC$(3)
1050 LPRINT TAB(3);LD$(1);TAB(27);LD$(2);TAB(51);LD$(3)
1060 LPRINT TAB(3);LE$(1);TAB(27);LE$(2);TAB(51);LE$(3)
1070 LPRINT:LPRINT
1080 RETURN
1090 FOR K=1 TO 3
1100 LA$(K)=STRING$(19," ")
1110 LB$(K)=STRING$(19," ")
1120 LC$(K)=STRING$(19," ")
1130 LD$(K)=STRING$(19," ")
1140 LE$(K)=STRING$(19," ")
1150 NEXT K
1160 RETURN
1170 FOR J=1 TO NO
1180 I=IND(J)
1190 GOSUB 1220
1200 NEXT J
1210 RETURN
1220 REM Circular letter
1230 LPRINT FF$
1240 LPRINT E1$;"CLEVELAND SUB-AQUA HANG-GLIDING CLUB"
1250 LPRINT E0$
1260 LPRINT TAB(55);"30 LINDEN GROVE"
1270 LPRINT TAB(55);"LINTHORPE"
1280 LPRINT TAB(55);"MIDDLESBROUGH"
1290 LPRINT TAB(55);"TS5 5DW"
1300 LPRINT
1310 LPRINT TAB(55);"Tel. 821623"
1320 LPRINT:LPRINT
1330 LPRINT NT$(I);
1340 LPRINT USING " ! ";NF$(I);
1350 LPRINT NS$(I)
1360 LPRINT AS$(I):LPRINT AT$(I):LPRINT AP$(I)
1370 LPRINT:LPRINT
1380 LPRINT "Dear ";NT$(I);" ";NS$(I);","
1390 LPRINT
1400 LPRINT U1$;"EVENTS FOR THE NEW SEASON";U0$
1410 LPRINT
1420 LPRINT "I am pleased to let you know that the new season of sub-aqua hang-g
liding"
1430 LPRINT "events is about to start."
1440 LPRINT
1450 LPRINT "The club's new schedule of events is enclosed for your interest and
 I hope"
1460 LPRINT "we will have the pleasure of your company on several of our dives o
ver the"
1470 LPRINT "next few weeks."
1480 LPRINT
1490 LPRINT "May I also draw your attention to the jumble sale that we will be h
aving"
1500 LPRINT "at Pool Number 2 of Middlesbrough Swimming Baths on July 2nd.  A si
milar"
1510 LPRINT "event last year was very well supported, and I would be grateful if
 you"
1520 LPRINT "could canvass your friends and neighbours in the ";AT$(I)
1530 LPRINT "area so that we can have plenty of jumble on offer."
1540 LPRINT
1550 LPRINT "Yours sincerely,"
1560 FOR K=1 TO 5:LPRINT:NEXT K
1570 LPRINT "CLUB SECRETARY"
1580 RETURN
```

Routine 540... Exchange sort procedure.

Routine 630... Continuation.

Routine 650...Menu for the selection of one of the three reports.

Routine 730...Loop for setting up and printing membership list.

Routine 780...Print a line pair of the membership list.

Routine 840...Loop for setting up and printing name and address labels.

Routine 930...Set up a label.

Routine 1010...Print a group of three labels across the page.

Routine 1090...Clear the next group of three labels.

Routine 1170...Loop for printing circular letter.

Routine 1220...The circular letter.

Finally here is a list of the new data names used in the printing section of the program, together with their meanings:

E1$ enlarge on control sequence

E0$ enlarge off control sequence

FF$ form feed control character

LA$)
LB$)
LC$) — arrays holding label lines 1-5 respectively

LD$)
LE$)

LC label count, between 1 and 3

U1$ underline on control sequence

U0$ underline off control sequence

Next month's instalment is a mammoth program listing encapsulating all the bells and whistles of the entire series. Don't miss it!

MSX

Under the Spell

A leading programmer is convinced the future lies with MSX. Nicole Segre talked to Steve Webb

If you like a fast and furious blend of arcade action, mystery and occult mayhem, then **Sorcery,** recently released for the MSX computers by Virgin Games, is the program you have been waiting for.

Readers of the May issue of *MSX User* may remember that we had nothing but praise for the game, which features a good wizard battling against evil spirits, flying skulls and hooded ghouls in a quest to release eight imprisoned friends.

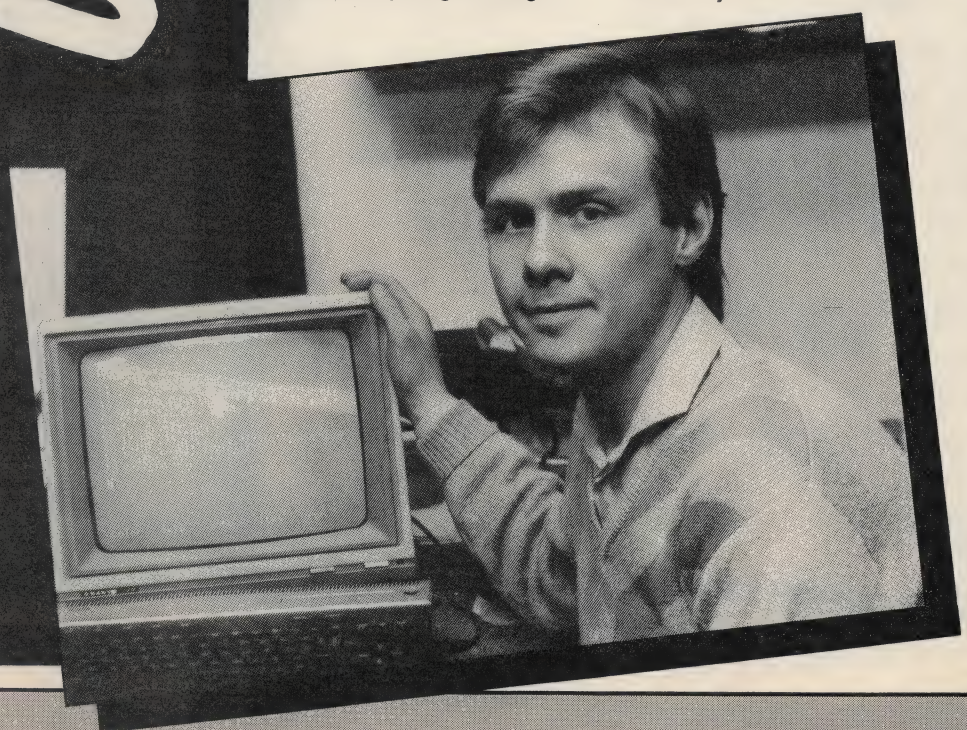
As in a classic adventure game, there are mysteries to be unravelled, objects to be found and used, and a variety of locations to explore — but unlike the traditional examples of such games, Sorcery features no text. Its puzzles must be solved while you frantically manoeuvre your wizard hero with the keyboard or joystick and attempt to discover the rules of the game as you go along.

Popular in its previous incarnations for the Spectrum, Commodore 64, and more recently the Amstrad, Sorcery for the MSX is more elaborate and sophisticated than earlier versions. It has many more puzzles, and a total of 50 screens or locations, as opposed to 15 on the Spectrum, 17 on the Commodore and about 40 on the Amstrad.

The programmer behind this feat of wizardry is Steve Webb, technical manager at Virgin Games and as such in charge of the company's famous 'Gang of Five' programmers.

Webb wrote the MSX version of Sorcery chiefly because he is a MSX enthusiast. 'I am convinced that MSX will become a huge success,' he says, 'and that its critics will forget that they ever criticised.'

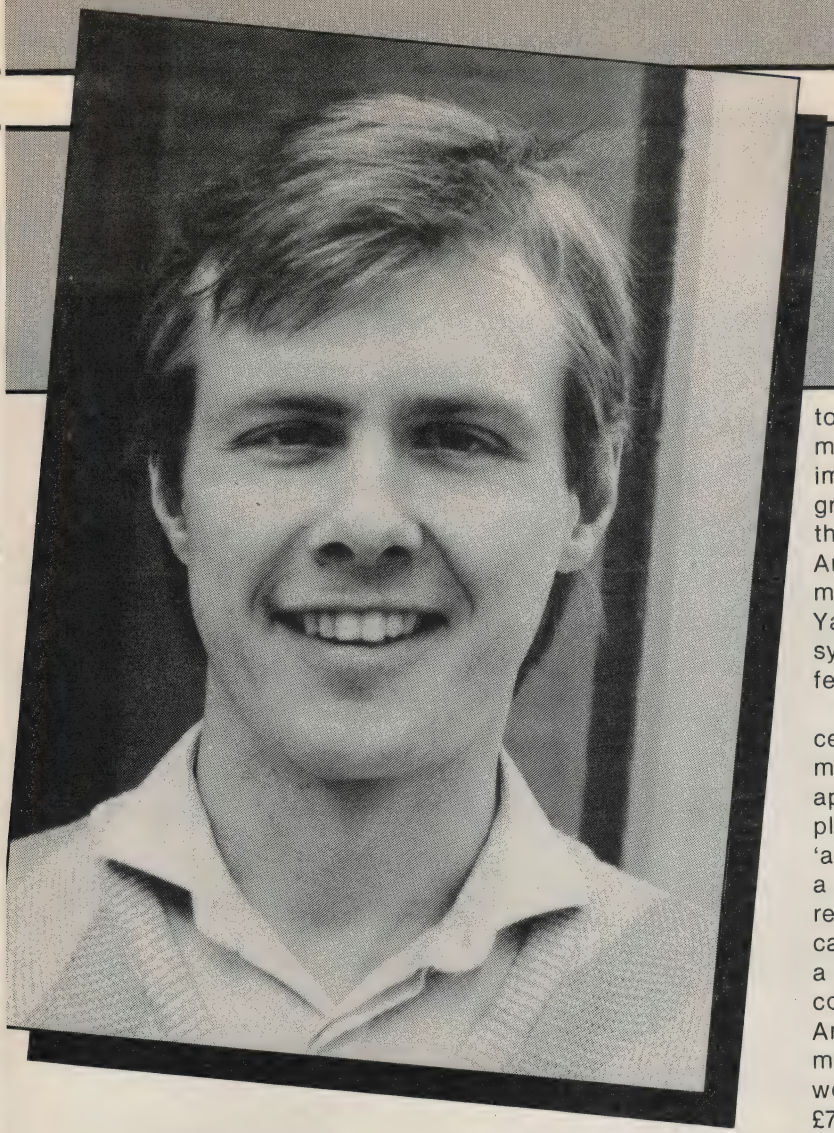
The chief ingredient of that success, Webb feels, is standardisation. 'MSX is the only machine that will be able to integrate with TVs or hi-fis or to control a home. Nobody knows yet what the actual applications will be — but whatever they are, you won't be able to fit a QL or an Amstrad into the system.'



Before becoming enamoured of MSX, Webb's only previous experience of micros was with a Spectrum bought as a hobby. Born and raised in Bournemouth, 29-year-old Webb trained as an electronics engineer in the RAF, then learned computer engineering with ICL. 'My background is entirely in hardware,' he says, 'but it has all become too sophisticated now with everything tucked away inside little black boxes. Software is much more fun to play around with.'

Two years ago, Virgin Games advertised for a technical manager and Webb got the job. His original task was to look at games sent in by hopeful programmers and decide which were worth publishing. Since then, Virgin ;games has undergone a change in direction, and Webb's role has changed accordingly.

'Whereas we used to produce large numbers of games in a hit-and-miss fashion, we are concentrating only on the top of the range now. The software market has become so competitive that only the best games can hope to survive.' Today, Virgin Games have a total of about half a dozen games out on the market, and aim to release no more than two titles a month in the future.



The 'Gang of Five' ('there are actually six of us,' Steve Webb points out) work as a team, using the machine for which they are writing rather than expensive development systems. 'You don't really need high speeds to develop a game,' says Steve.'More of your time is spent thinking about it rather than actually programming.'

For Sorcery, Webb wrote the program entirely on tape using a Sanyo computer and downloading onto a Toshiba as a back-up — a standard Gang of Five procedure. Another member of the team produced the graphics and another the sound, with Webb co-ordinating their efforts. The whole process took two months.

Steve Webb says he would like to concentrate his future efforts entirely on MSX but does not believe that will be possible for some time. 'There simply aren't enough machines out there to make it worth our while,' he says.

Recent estimates put the number of MSX machines sold in Britain so far at somewhere between 15,000 and 20,000. 'We need to sell 10,000 copies of a game before we break even,' says Webb. 'That would cover marketing, advertising, printing costs and general overheads as well as programming time. If you reach 10% to 20% of the user base with each game, as we normally hope to, that means you have to have a user base of 100,000 MSX machines. So there's a long way to go yet.'

Nevertheless, Steve Webb does not think the situation is entirely hopeless, since the promised arrival ofMSX Mark 2 should give sales a much needed boost. Rumour has it, according to Webb, that the new machines will have improved high-resolution graphics, comparable to those on, say, the Amstrad, and that they might even incorporate Yamaha's sound synthesiser as a standard feature.

'Better graphics should certainly give the machines a lot more appeal to the games playing public,' says Webb, 'although they would need a considerable price reduction as well.' Webb calculates that at present, a complete MSX system comparable to the £449 Amstrad with its colour monitor and disk drives would cost upwards of £700. 'Ridiculous, really,' he comments.

In other respects, however, Steve Webb thinks that the MSX machines can stand comparison with any other micro on the market. 'I don't know what people mean when they say the technology is outdated,' he says. 'The machines have reasonable graphics, good sound, good keyboards and good disk drives. They are also a pleasure to program, because they have more usable memory than any others.' The MSX has its own 16K video RAM chip, which means that virtually all the 32K or 64K of the computer's memory is available for programming, rather than being taken up with screen graphics he explains.

Looking into the future of MSX, Steve Webb thinks that in time Mark 2 will be followed by a Mark 3 with a 16-bit chip aimed at the business market. He does not see that, however, as a promising avenue for Virgin Games. 'There are plenty of companies more experienced at writing business software than we are,' he says.

Webb feels that there is still plenty of life left in the games market, provided quality is maintained, and looks forward to being able to write more and better games for the MSX. 'I'd love to do a conversion of Strangeloop, which has done well for the Commodore. Falcon Patrol is another good colourful game which I'm sure the MSX could cope with. A disk version of Sorcery is another tempting possiblity.

Even further ahead, Webb sees games written on compact discs ('Think of it,' he says. 'Sorcery could have 200 different locations') and games using interactive video. The most intriguing prospect of all is that of the home-based applications which beckon mysteriously just around the corner. 'I'd love to write the software for those,' says Webb, 'but I don't know yet what they will be. If I did, I'd be a rich man. We will probably have to wait for someone outside the industry to come up with the ideas.'

Apart from the quality of the machines themselves and the advantages of standardisation, there is another aspect of the MSX situation that Webb finds reassuring. 'Japanese companies don't usually fail in anything,' he says. 'Like hi-fis, videos, and Walkmans, MSX will soon become part of our lives.'

MSX

Inside the Wreck

Eric Doyle surfaces with the story of a hazardous underwater journey

THE WRECK
Electric Software
£14.95
Cassette

Electric Software boast that **The Wreck** will be the first MSX originated game to make a sizeable impact on the software charts. Having made an exploratory dive to test the water, I think they may be right.

The setting is a wreck languishing on the sea bed. Filled to the gunnels with gold, the ship has three labrynths decks which must be negotiated in your search for the treasure. The wreck is patrolled by guardian jellyfish which can blast you through the maze with a massive electric charge which leaves you gasping large quantities of your limited air supply.

The booklet accompanying the game tells the story of how you, as the hero, have been searching for the wreck of the Beaulieu Anne. A chance meeting with an old sea dog in a seedy bar reveals how he once served on the Bully Ann, a foreign vessel which foundered when the crew mutinied for their share of the gold bullion (Bully Ann, indeed).

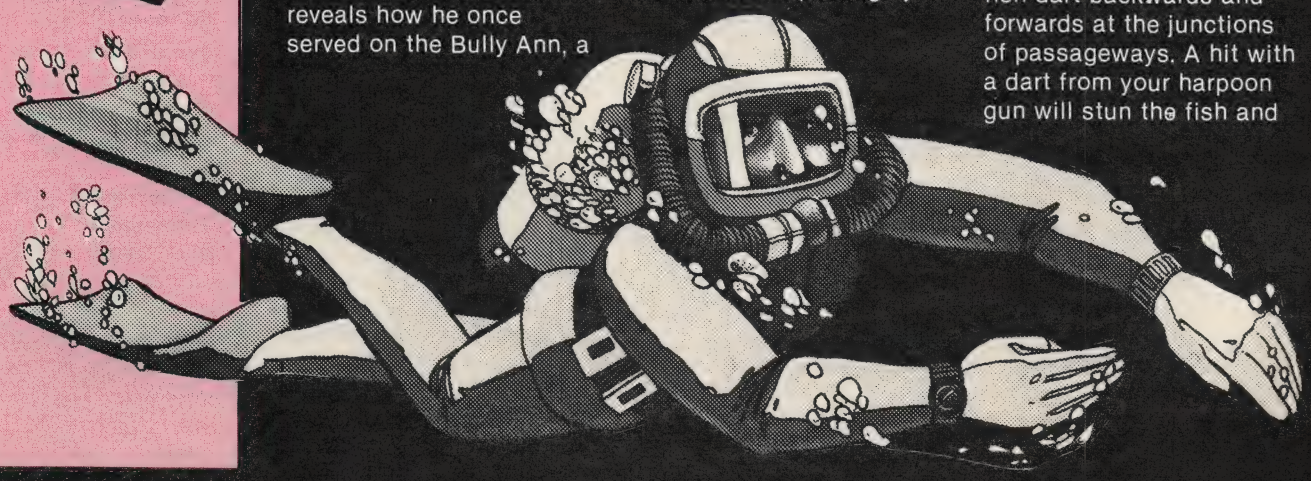
Quick as a flash you realise that the Bully Ann and the Beaulieu Anne are one and the same, but the seaman's story does not end there. From his pocket he produces the same blood-stained handkerchief which his dying captain thrust into his hand as they escaped. Still readable on the handkerchief is the code which holds the key to the mystery of the gold's location. Luckily for you the old sailor is illiterate and needs a friend to help. Your partnership is cemented when you save the old man from his creditors.

The game now takes up the story and you find yourself gazing through a diving mask at the ship's only entry point. Once inside, you stand on the first deck with a guardian jellyfish approaching. At the end of the passage you can see a red starfish which will remain there throughout the game.

If you kill the guardian, its death throes are quite spectacular — not one for the animal liberationists this. Your path is then clear until the next guardian is encountered. The best method of escape is to back away from guardians, firing all the time, even though this may mean retracing your steps. Otherwise one touch of those tentacles will send you reeling around the maze, possibly into unchartered zones and almost certain death.

Before moving on, remember that outside here your extra air tanks will appear, having been lowered by the old man in the boat above. There are ten tanks in all, including the one you are wearing, and they will gradually empty unless you meet a guardian at close quarters. Contact with one makes you breathe more heavily for a while and the air level indicator, to the right of the screen, drops alarmingly. Yet another reason to avoid guardians.

As you progress through the maze, marker fish dart backwards and forwards at the junctions of passageways. A hit with a dart from your harpoon gun will stun the fish and



it will remain where it falls for the rest of the game. Being different in type and colour, the fish make excellent orientation points. Noting each fish's position in relation to other stunned fish certainly helps to solve the difficult, non-linear mazes on the lower two decks.

All the creatures in the game are hard to kill but I found that holding the fire button down was the best way of dealing with the markers — but only after a long time during which a guardian may appear and scare the fish away.

Around any corner you could find yourself in a cul-de-sac harbouring a safe or a clue to its combination lock. There are six clues on each level which take the form of six rows up and seven across. Using the grid on the captain's handkerchief, they each give a letter of the combination and when all six are found the safe can be opened.

There is one safe on each floor and the first two contain essential clues to the combination of the safe on the next floor. The third safe contains the gold and an egg which hatches into a homicidal alien who creeps up behind you with evil intent. The only way to protect yourself is to turn around quickly and shoot as it scuttles off into the shadows.

Once you have opened the safe you must recover as much gold as possible before your air supply runs out.

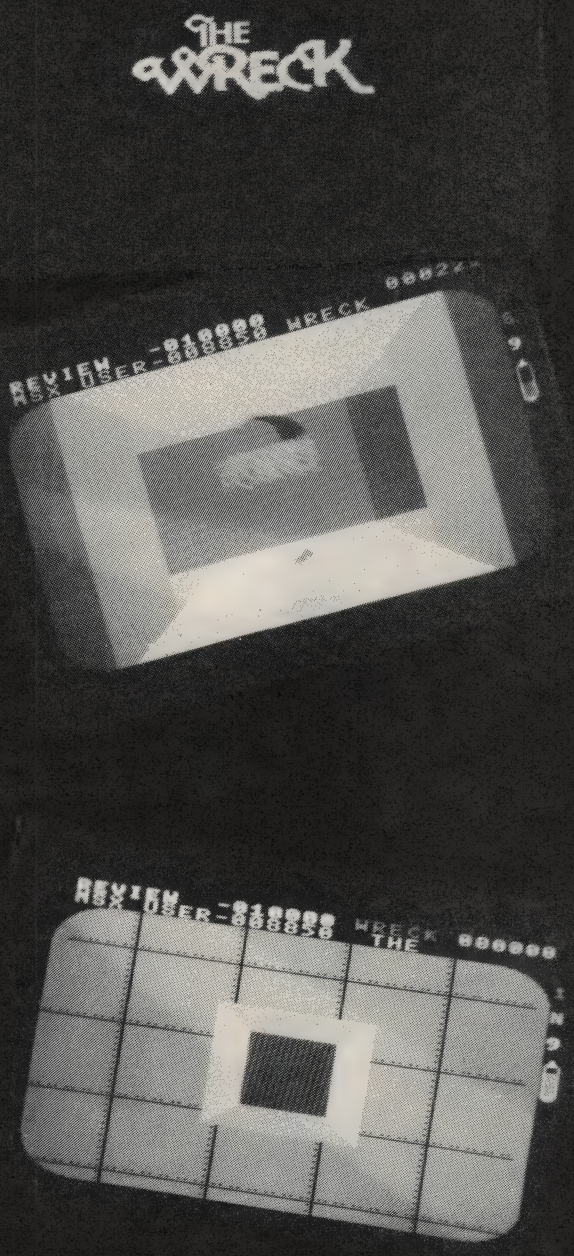
To collect a fresh air tank or to send gold up to your salty partner, you must return to the entrance. This may either be done by working your way from deck to deck through the maze or by finding the secret short cuts on decks two and three.

The first deck is the usual linear maze, one location leading to the next and directly back again, but on the lower decks disorientation sets in as the maze becomes non-linear. Taking more than one step forward moves you to a new location and you cannot get back to your original position simply by turning round and retracing your steps.

The use of marker fish becomes vital at this point and to help you chart these complex mazes, the package contains a specially devised chart upon which you write the type of fish which you have stunned at the four compass directions from the present marker fish location. The chart can be wiped clean after each game because the fish will not always appear in the same locations.

Electric estimate that it will take fifty hours or more to fathom the depths of the wreck and recover the treasure. Be that as it may, they have produced an excellent game with its many puzzles and challenges and it should do very well in the software stakes.

The price of £14.95 is perhaps artificially inflated to allow for the introduction of the cartridge version later this year at the same price, but despite this quibble I suggest that all you Jacques Cousteau types don your flippers and take the plunge.



MSXplained

Graham Knight and Stuart Pirie show how to get the most out of your printer.

Printing with MSX BASIC

Now that many readers are adding printers to their MSX systems this edition of MSXplained is devoted entirely to BASIC commands for dot matrix printers.

The illustration in the top half of figure 1 shows a variety of MSX typefaces in ten different character sizes. The lower half of figure 1 shows the actual program which did the printing.

All printing is controlled by the LPRINT command — the only exception is LLIST which lists a program from memory to the printer. LPRINT "MSX USER" will simply print the words MSX USER on the paper. The LPRINT command can also be suffixed with CHR$ (n);"X"; — where n is a number and x is a letter. These numbers and letters set the printer mode.

This concept is most easily understood by examining the make-up of **program 1** and comparing it with the printout above it. In line 140 CHR$(15) sets the printer to normal size and CHR$(27);"N" selects the Pica typeface which prints the words NORMAL SIZE in the 10 characters per inch mode.

The three typefaces shown, Compressed, Elite, and Pica, all start with CHR$(27);. The letters "Q"; "E"; or "N" follow after the semi colon in CHR$(27) and this completes the font selection.

In line 160 CHR$(27); "Q"; selects the Compressed typeface and in a similar way the "E" in line 190 and the "N" in 220 selects the Elite or Pica font. You will notice that the number of characters printed per inch is selected by the choice of typeface. Pica mode prints the widest letter.

```
NORMAL SIZE:

17 CHARACTERS PER INCH - COMPRESSED TYPEFACE ABCDEFGHIJKLMNOPQRSTUVWXYZ

12 CHARACTERS PER INCH - ELITE TYPEFACE ABCDEFGHIJKLMNOPQRSTUVWXYZ

10 CHARACTERS PER INCH - PICA TYPEFACE ABCDEFGHIJKLMNOPQRSTUVWXYZ

DOUBLE SIZE:

8.5 CHARACTERS PER INCH - COMPRESSED TYPEFACE

6 CHARACTERS PER INCH - ELITE TYPEFACE

5 CHARACTERS PER INCH - PICA TYPEFACE

BACK TO ORDINARY SIZE - 10 PICA CHARACTERS PER INCH
```

PROGRAM 1

```
100 KEY OFF:SCREEN 0:WIDTH 37:COLOR 15,4:LOCATE 2,10
110 PRINT"SWITCH ON MSX DOT MATRIX PRINTER"
120 FOR GK=1 TO 4000:NEXT:LOCATE 0,13
130 PRINT"COMPRESSED, ELITE, PICA & DOUBLE SIZE"
140 LPRINT CHR$(15);CHR$(27);"N NORMAL SIZE:"
150 LPRINT
160 LPRINT CHR$(27);"Q";"  17 CHARACTERS PER INCH - COMPRESSED TYPEFACE ";
170 LPRINT"ABCDEFGHIJKLMNOPQRSTUVWXYZ"
180 LPRINT
190 LPRINT CHR$(27);"E";" 12 CHARACTERS PER INCH - ELITE TYPEFACE ";
200 LPRINT"ABCDEFGHIJKLMNOPQRSTUVWXYZ"
210 LPRINT
220 LPRINT CHR$(27);"N";" 10 CHARACTERS PER INCH - PICA TYPEFACE ";
230 FOR GK=&H41 TO &H5A:LPRINT CHR$(GK);:NEXT GK
240 LPRINT:LPRINT:LPRINT CHR$(15);CHR$(27);"N DOUBLE SIZE:"
250 REM CHANGE TO DOUBLE SIZE
260 LPRINT CHR$(14)
270 LPRINT CHR$(27);"Q";" 8.5 CHARACTERS PER INCH - COMPRESSED TYPEFACE"
280 LPRINT
290 LPRINT CHR$(27);"E";" 6 CHARACTERS PER INCH - ELITE TYPEFACE"
300 LPRINT
310 LPRINT CHR$(27);"N";" 5 CHARACTERS PER INCH - PICA TYPEFACE"
320 LPRINT CHR$(15)
330 LPRINT"  BACK TO ORDINARY SIZE - 10 PICA CHARACTERS PER INCH"
```

```
ORDINARY SIZE PROPORTIONAL PRINTER TEST

1 DOT GAP ABCDEFGHIJKLMNOPQRSTUVWXYZ
2 DOT GAP ABCDEFGHIJKLMNOPQRSTUVWXYZ
3 DOT GAP ABCDEFGHIJKLMNOPQRSTUVWXYZ
4 DOT GAP ABCDEFGHIJKLMNOPQRSTUVWXYZ
5 DOT GAP ABCDEFGHIJKLMNOPQRSTUVWXYZ
6 DOT GAP ABCDEFGHIJKLMNOPQRSTUVWXYZ

DOUBLE SIZE PROPORTIONAL TEST

ABCDEFGHIJKLMNOPQRS
ABCDEFGHIJKLMNOPQRS
ABCDEFGHIJKLMNOPQRS
ABCDEFGHIJKLMNOPQRS
ABCDEFGHIJKLMNOPQRS
ABCDEFGHIJKLMNOPQRS
```

PROGRAM 2

```
100 KEY OFF:SCREEN 0:COLOR 15,4:LOCATE 4,10
110 PRINT"SWITCH ON MSX DOT MATRIX PRINTER"
120 FOR GK=1 TO 4000:NEXT:LOCATE 7,13
130 PRINT"PROPORTIONAL PRINTING TEST"
140 REM SET PRINTER TO ORDINARY SIZE PROPORTIONAL
150 LPRINT CHR$(15):LPRINT
160 LPRINT CHR$(27);"P";
170 LPRINT"ORDINARY SIZE PROPORTIONAL PRINTER TEST"
180 LPRINT
190 FOR SP=&H31 TO &H36
200 LPRINT CHR$(SP);" DOT GAP ";
210 FOR GK=&H41 TO &H5A
220 LPRINT CHR$(GK);CHR$(27);CHR$(SP);
230 NEXT GK:LPRINT:NEXT SP
260 LPRINT:LPRINT CHR$(14);
270 LPRINT "DOUBLE SIZE PROPORTIONAL TEST"
280 LPRINT
290 FOR SP=&H31 TO &H36
300 FOR GK=&H41 TO &H53
310 LPRINT CHR$(GK); CHR$(27); CHR$(SP);
320 NEXT GK:LPRINT:NEXT SP
340 REM RETURN PRINTER TO ORDINARY SIZE
350 LPRINT CHR$(15)
360 REM THIS LISTING ITSELF IS IN PROPORTIONAL FORMAT
```

Once a typeface code has been added to an LPRINT command all the subsequent LPRINT lines are printed in that mode until a new CHR$ command is programmed and executed.

Note that line 230 is simply another way of getting the printer to print the letters A to Z. The CHR$(14) in line 260 changes the printer to double size and all the following lines are in this mode. Double size characters are still printed with the same height but are in fact only double in width. The CHR$(15) in line 320 returns the printer to ordinary size.

Proportional printing

In Elite, Pica and Compressed modes the space between letters is always the same. In proportional mode the gap can be varied from the equivalent of one to six dots. In double size mode this gap varies from two to twelve dots. The printout in Figure 2 shows this effect.

In **program 2** line 150 sets the printer to ordinary mode and line 160 selects the gap and this is set in a loop beginning at line 190. In line 210 GK stores the letters A to Z. Line 220 prints the value of GK (beginning with the letter A) followed by a one-dot space set by the variable SP. Line 230 completes the loop, printing the alphabetical letters with six different gaps. Line 260 sets the printer to double size mode. Line 300 selects the letters A to S and the printing process repeats in the larger proportional type size.

If after running the program you enter the LLIST command you will notice that the listing for program 2 is also printed in proportional type.

```
SINGLE STRIKE COMPRESSED DOUBLE STRIKE COMPRESSED
SINGLE STRIKE COMPRESSED DOUBLE STRIKE COMPRESSED

ORDINARY SINGLE  DOUBLE STRIKE ELITE
ORDINARY SINGLE  DOUBLE STRIKE ELITE

PROPORTIONAL     DOUBLE STRIKE PROPORTIONAL
PROPORTIONAL     DOUBLE STRIKE PROPORTIONAL

SINGLE PICA      DOUBLE STRIKE ELITE PRINTING
SINGLE PICA      DOUBLE STRIKE ELITE PRINTING
```

PROGRAM 3

```
100 KEY OFF:SCREEN 0:COLOR 15,8:LOCATE 2,10
110 PRINT"SWITCH ON MSX DOT MATRIX PRINTER"
120 FOR GK=1 TO 4000:NEXT:LOCATE 3,13
130 PRINT"SINGLE AND DOUBLE STRIKE TEST"
140 FOR SP=1 TO 2
150 GOSUB 2000
160 LPRINT CHR$(27);"Q";"SINGLE STRIKE COMPRESSED ";
170 GOSUB 1000
180 LPRINT"DOUBLE STRIKE COMPRESSED "
190 NEXT SP:LPRINT
200 FOR SP=1 TO 2
210 GOSUB 2000
220 LPRINT CHR$(27);"E";"ORDINARY SINGLE  ";
230 GOSUB 1000
240 LPRINT"DOUBLE STRIKE ELITE "
250 NEXT SP:LPRINT
260 FOR SP=1 TO 2
270 GOSUB 2000
280 LPRINT CHR$(27);"P";"PROPORTIONAL     ";
290 GOSUB 1000
300 LPRINT"DOUBLE STRIKE PROPORTIONAL"
310 NEXT SP:LPRINT
320 FOR SP=1 TO 2
330 GOSUB 2000
340 LPRINT CHR$(27);"N";"SINGLE PICA  ";
350 GOSUB 1000
360 LPRINT" DOUBLE STRIKE ELITE PRINTING"
370 NEXT SP
380 END
1000 LPRINT CHR$(27);CHR$(33);:RETURN
2000 LPRINT CHR$(27);CHR$(34);:RETURN
```

Double strike printing

The previous examples have all shown single strike printing. It is easy to program a double strike from the print head, so that the same letters are printed twice. This gives a blacker, emphasised printout. The difference between single and double strike printing can be seen from the printout above **program 3.**

The program itself is straightforward and uses the techniques described earlier to select the four typefaces. The most important section is the two subroutines at the end. Line 2000 selects single strike and line 1000 changes the printer to double strike mode.

Underlining

The **program 4** printout shows how to underline, to emphasise and to mix the different character sizes in the same line. The techniques learned in program 3 are used throughout program 4 to emphasise words.

In line 190 the underlining is turned on by the CHR$(27);"X" and is stopped by the following CHR$(27);"Y";. The program for the second line of the illustrated printout starts at line 200 and inserts the MSX control codes appropriate to the size of letter to be printed.

LETTERS CAN BE EMPHASISED, ORDINARY, OR EVEN UNDERLINED AND EMPHASISED

DIFFERENT SIZES CAN BE PRINTED IN THE SAME LINE — LIKE THESE LETTERS

PROGRAM 4

```
100 KEY OFF:SCREEN 0:COLOR 15,13:LOCATE 2,10
110 PRINT"SWITCH ON MSX DOT MATRIX PRINTER"
120 FOR GK=1 TO 4000:NEXT:LOCATE5,13
130 PRINT"UNDERLINE AND EMPHASIS TEST"
140 LPRINT
150 LPRINT CHR$(27);"N";" ";CHR$(27);CHR$(34);"LETTERS CAN BE ";
160 LPRINT CHR$(27);CHR$(33);"EMPHASISED, ";
170 LPRINT CHR$(27);CHR$(34);" ORDINARY, OR EVEN ";
180 LPRINT CHR$(27);CHR$(33);
190 LPRINT CHR$(27);"X";"UNDERLINED AND EMPHASISED"CHR$(27);"Y"
200 LPRINT CHR$(15):LPRINTCHR$(27);"Q";"   DIFFERENT SIZES  ";
210 LPRINT CHR$(27);"N";"CAN BE PRINTED ";CHR$(14);"IN THE SAME LINE - ";
220 LPRINT CHR$(15);CHR$(27);"Q";"LIKE THESE LETTERS"
230 LPRINT CHR$(27);CHR$(34)
```

User-defined graphic printing

As well as printing all 255 characters the MSX BASIC can also be programmed to print user-defined characters. This is made possible by the fact that MSX dot matrix printers allow the user to specify which of the print head wires are to be fired during printing.

Program 5 prints the data in lines 120-270 as a graphic character to the printer. The resultant printout is shown above the program. The first line changes the line feed pitch from the usual 1/6″ to 17/144″ so that there are no gaps between the printed shape. Line 310 selects the dot addressable graphics mode and tells the printer to expect 25 bytes of data per line as the print head passes from left to right. Note that the top half of the shape is printed first and then the printer does a second pass to complete the character.

Readers can print their own characters by modifying lines 120-270. Draw out a shape on paper first and then transfer it into dots and X's to make up the shape of your own character — remember to stay within a grid which is 25 characters wide and 16 in height.

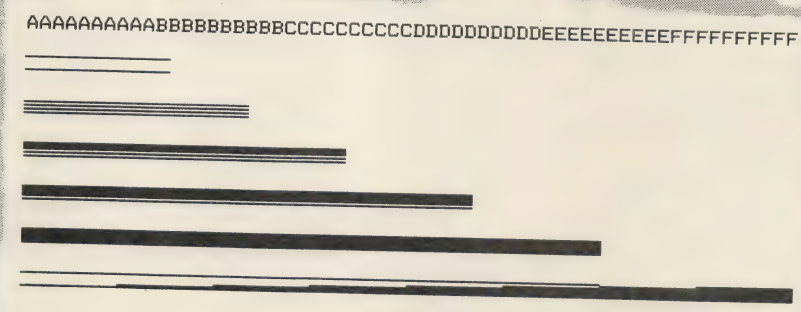
Repeat printing

Program 6 and its printout shows examples of repeat printing. Line 140 selects the letters ABC. In line 150 the CHR$(27); "RO10"; sends the letters ABC to the printer ten times. Simply vary the number following the R to alter the rate of repeats.

The information in line 170 printed the two parallel lines below the letters. In the data following the CHR$ both

PROGRAM 5

```
100 LPRINT CHR$(27);"T17"
110 DIM A$(16)
120 DATA .........X.X.X.X.........
130 DATA .XXX....XXXXXXXXX....XXX.
140 DATA .XXXX..XXXXXXXXXXX..XXXX.
150 DATA ....XXXXXXXXXXXXXXXXX....
160 DATA .....XXX..XXXXX..XXX.....
170 DATA ....XXX....XXX....XXX....
180 DATA ...XXXXX..XXXXX..XXXXX...
190 DATA ...XXXXXXXXXXXXXXXXXXX...
200 DATA ...XXXXX..XXXXX..XXXXX...
210 DATA ....XXXX..XXXXX..XXXX....
220 DATA .....XXXX.......XXXX.....
230 DATA ......XXXXXXXXXXXXX......
240 DATA .......XXXXXXXXXXX.......
250 DATA ......XXX.......XXX......
260 DATA .....XXX.........XXX.....
270 DATA ..XXXXXX.........XXXXXX..
280 REM READ DATA
290 FOR F=1 TO 16:READ A$(F):NEXT F
300 FOR V%=0 TO 8 STEP 8
310 LPRINT CHR$(27);"G0025";
320 FOR F%=1 TO 25:M%=1:T%=0
330 FOR Y%=1 TO 8
340 T%=T%-M%*(MID$(A$(Y%+V%),F%,1)="X")
350 M%=M%*2:NEXT Y%
360 LPRINT CHR$(T%);
370 NEXT F%:LPRINT:NEXT V%
```



PROGRAM 6

```
100 KEY OFF:SCREEN 0:WIDTH 37:COLOR 15,4:LOCATE 2,10
110 PRINT"SWITCH ON MSX DOT MATRIX PRINTER"
120 FOR GK=1 TO 4000:NEXT:LOCATE 4,13
130 PRINT"REPEAT PRINTING OF CHARACTERS"
140 FOR GK=&H41 TO &H46
150 LPRINT CHR$(27);"R010";CHR$(GK);
160 NEXT GK:LPRINT:LPRINT
170 LPRINT CHR$(27);"V0090";CHR$(&B10000001):LPRINT
180 LPRINT CHR$(27);"V0140";CHR$(&B10101010):LPRINT
190 LPRINT CHR$(27);"V0200";CHR$(&B10101111):LPRINT
200 LPRINT CHR$(27);"V0280";CHR$(&B10111111):LPRINT
210 LPRINT CHR$(27);"V0360";CHR$(&B11111111):LPRINT
220 LPRINT CHR$(27);"V0060";CHR$(&B10000001);
230 LPRINT CHR$(27);"V0060";CHR$(&B11000001);
240 LPRINT CHR$(27);"V0060";CHR$(&B11100001);
250 LPRINT CHR$(27);"V0060";CHR$(&B11110001);
260 LPRINT CHR$(27);"V0060";CHR$(&B11111001);
270 LPRINT CHR$(27);"V0060";CHR$(&B11111101);
280 LPRINT CHR$(27);"V0060";CHR$(&B11111110);
290 LPRINT CHR$(27);"V0060";CHR$(&B11111111)
```

the 1's set the spacing between the lines. The "V0090" prints the lines for 90 dots horizontally. In line 180 the data has been altered to program printing of four lines of 140 dots per line. Lines 160-200 all illustrate programming the print head wires over a specified horizontal width.

Lines 220-250 print immediately after each other due to the semi colon which ends each line. Line 220 starts by printing two dots vertically over 60 dots horizontally. The number of vertical dots printed progresses to 8 vertical dots by line 290.

Super scripts

MSX BASIC also allows easy programming of margins, super and subscripts — see **program 7**. Line 140 sets the left margin to the extreme left "L000". Lines 150 and 160 print the row of figures. Notice that the N to select Pica type can be included at the start of the information to be printed.

Lines 170-210 show how the "L" command sets different left hand margins. In lines 220-300 the lower case letter s is used to set super scripts (s1) and subscripts (s2). Line 300 cancels the super script mode.

The printout above the listing for program 7 shows how flexible these special script commands can be. Experiment with them yourself by making modifications to the data in lines 170-290.

Square printing

Combining the capability of printing dots horizontally and vertically with being able to set small line feeds even allows the user to print squares. Users should note that the squares can be printed in the different character modes.

Experiment by changing the "E" in line 150 to a letter which designates a different typeface. Note that changing modes changes the size of the printed square — even when the same parameters are specified. Compressed mode prints the smallest square and Pica prints the largest.

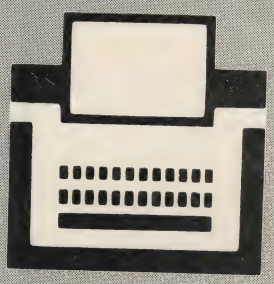
```
012345678901234567890234567890123456789012345678901234567890
     LEFT MARGIN
                SETS LEFT MARGIN
                          SETS LEFT MARGIN
                                    SETS LEFT MARGIN

THIS IS HOW TO PRINT SUBSCRIPT LETTERS AND FIGURES

THIS IS HOW TO PRINT SUPER-SCRIPTS 123456789012345

SUPER-SCRIPTS AND SUBSCRIPTS CAN BE MIXED TOGETHER
```

PROGRAM 7

```
100 KEY OFF:SCREEN 0:WIDTH 37:COLOR 15,4:LOCATE 2,10
110 PRINT"SWITCH ON MSX DOT MATRIX PRINTER"
120 FOR GK=1 TO 4000:NEXT:LOCATE 2,13
130 PRINT"SETTING MARGINS AND SUPERSCRIPTS"
140 LPRINT CHR$(27);"L000"
150 LPRINT CHR$(27);"N012345678901234567890";
160 LPRINT CHR$(27);"123456789012345678901234567890"
170 LPRINT CHR$(27);"L005";"LEFT MARGIN"
180 LPRINT CHR$(27);"L015SETS LEFT MARGIN"
190 LPRINT CHR$(27);"L025SETS LEFT MARGIN"
200 LPRINT CHR$(27);"L035";"SETS LEFT MARGIN"
210 LPRINT CHR$(27);"L000"
220 LPRINT CHR$(27);"s0";"THIS IS HOW TO ";
230 LPRINT CHR$(27);"s2PRINT SUBSCRIPT LETTERS AND FIGURES":LPRINT
240 LPRINT CHR$(27);"s0";"THIS IS HOW TO ";
250 LPRINT CHR$(27);"s1PRINT SUPER-SCRIPTS 123456789012345":LPRINT
260 LPRINT CHR$(27);"s1SUPER-SCRIPTS";
270 LPRINT CHR$(27);"s2AND SUBSCRIPTS";
280 LPRINT CHR$(27);"s1CAN BE MIXED";
290 LPRINT CHR$(27);"s2TOGETHER"
300 LPRINT CHR$(27);"s0"
```

PROGRAM 8

```
100 KEY OFF:SCREEN 0:WIDTH 37:COLOR 15,13
110 LOCATE 2,10
120 PRINT"SWITCH ON MSX DOT MATRIX PRINTER"
130 FOR GK=1 TO 4000:NEXT:LOCATE 6,13
140 PRINT"RECTANGLE PRINTING TEST"
150 LPRINT CHR$(27);"E"
160 LPRINT CHR$(27);">";
170 LPRINT CHR$(27);"T16";
180 LPRINT CHR$(27);"S0001";CHR$(255);
190 LPRINT CHR$(27);"V0398";CHR$(1);
200 LPRINT CHR$(27);"S0001";CHR$(255)
210 FOR GK=1 TO 10
220 LPRINT CHR$(27);"S0001";CHR$(255);
230 LPRINT CHR$(27);"V0398";CHR$(0);
240 LPRINT CHR$(27);"S0001";CHR$(255)
250 NEXT GK
260 LPRINT CHR$(27);"S0001";CHR$(255);
270 LPRINT CHR$(27);"V0398";CHR$(128);
280 LPRINT CHR$(27);"S0001";CHR$(255)
```



MSX

Contact

A

ACTIVISION, 15 Harley House, Marylebone Rd, London, NW1:

Ghostbusters
Beamrider
Decathlon
Pitfall II
River Raid
H.E.R.O.
Games — £11.99 each

A&F SOFTWARE, 8 Canalside Ind. Estate, Woodbine St East, Rochdale:

Chuckie Egg — game — £7.90

ALLIGATA, 1 Orange St, Sheffield, S1 4DW:

Blagger — game — £7.95
Contract Bridge — game — £9.95
Disc Warrior — game – £7.95

ANIROG, 8 The High St, Horley, Surrey, RH6 7AY:

Flightpath 737 — game — £7.95

ARTIC, Brandesburton, Driffield, North Humberside, YO25 8RL:

Mr. Wongs Loopy Laundry — game — £6.95

A.S.K., London House, 68 Upper Richmond Rd, London, SW15 2RP:

Number Painter — educational, 5-14 years — £8.95

B

BUBBLE BUS, 87 High St, Tonbridge, Kent, TN9 1RX:

Hustler
Boardello
Games — £6.99 each

C

CABLE SOFTWARE Cape House, 52 Limbury Rd, Luton, Beds LU3 2PL

Sprite Editor — utility — £7.95
Graphic Designer — utility — £14.95

CDS MICROSYSTEMS, Silver House, Silver St, Doncaster, Sth Yorkshire:

French is Fun
German is Fun
Italian is Fun
Spanish is Fun
Educational — £7.95 each

COMPUTER MATES, PO Box 2, Stockbridge, Hampshire:

Word Processor — business — £49
Cards System — business — £49
Cash Accounts System — business — £99
Double Entry Accounts — business — £99
Word Processing & Cards System combined — business — £75

E

ELECTRIC SOFTWARE, 91 High St, Longstanton, Cambs.

The Wreck — game — £14.95
Buzz Off — game — £8.95
Shark Hunter — game — £8.95
Norseman — game — £8.95
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Buck Rogers — game — £11.95
Le Mans — game — £9.95

H

HAL LABORATORIES Maple Walk, Bexhill, E. Sussex

Hole in One
Mr Ching
Rollerball
Super Billiards
Super Snake
Step Up
Games — £14.95 each

HI-SOFT, 180 High St Nth, Dunstable, Beds, LU6 1AT:

Devpac — utility — £19.95
Pascal Compiler — utility — £29.95

KEMP, 43 Muswill Hill, London, N1D 3PN:

Stock Control — business — £34.95

K

KONAMI, Television House, 269 Fieldend Rd, Eastcote, Middlesex:

King's Valley
Sky Jaguar
Super Cobra
Athletic Land
Circus Charlie
Antarctic Adventure
Comic Bakery
Monkey Academy
Mopiranger
Time Pilot
Hyper Olympic 1, Hyper Olympic 2
Hyper Shot
Hyper Sports 1, Hyper Sports 2
Yie Ar Kung-Fu
Games — £17.40 each

KUMA, 12 Horseshoe Park, Pangbourne, RG7 7JW:

Binary Land — game — £8.95
Eric & The Floaters — game — £8.95
Hyper Viper — game — £7.95
Spooks & Ladders — game — £6.95

Holdfast — game — £5.95
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WDPRO-Wordprocessor — business — £29.95
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Super Chess — game — £8.95
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Ninja — game — £6.95
Mean Streets — game — £6.95
Colour Fantasia — game — £9.95
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Zen Assembler — disk
Spread Sheet — business disk
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Kuma Forth — disk — £39.95 each
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Shadow of the Bear — game — £7.95
Galactic Mercenaries — game — £7.95
Death Valley Goldrush — game — £7.95

L

LEVEL 9 COMPUTING PO Box 39, Weston-Super-Mare, Avon BS24 9UR

Colossal Adventure
Adventure Quest
Dungeon Adventure
Snowball
Return to Eden
Lords of Time
Games — £9.95 each
Emerald Isle — game — £6.95

LLAMASOFT, 429 Mt Pleasant, Tadley, Hants:

Psychedelia — game — £5

LOTHLORIEN, 56A Park Lane, Poynton, Stockport, Cheshire, SK12 1RE

Special Operations — game
Panzer Attack — game
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M

MASTERTRONIC, Park Lorne, Park Rd, London NW8 7JL:

Space Walk
Finders Keepers
Games — £1.99 each

MEGACYCAL SOFTWARE, PO Box 6, Birkenhead, Merseyside L43 6XH
Gods of the Tomb — game — £9.20
Gumshoe Logic — game — £9.20
Revise Physics — educational — £8.50
Teach yourself Electricity — educational — £9.20

MELBOURNE HOUSE, Castle Yard House, Castle Yard, Richmond TW10 6TF

The Hobbit — game — £14.95
Classic Adventure — game — £6.95

MICRO-AID, 25 Fore St, Praze Camborne, Cornwall, TR14 0JX:

Cashbook — business — £14.95
Memo-Calc — business — £14.95
Payroll — business — £29.95

MR MICRO, 69 Partington Lane, Swinton, Manchester, M27 3AL:

Punchy — game
Humphrey — game
Cubit — game
Crazy Golf — game
£7.95 each

MIRRORSOFT, Holborn Circus, London ECP 1DQ:

737 Flight Simulator — game — £9.95

MORWOOD, Maple Walk, Bexhill, East Sussex:

Cannon Fighter
Panic Junction
Super Mind
Super Maze
Super Puzzle
Games — £6.95 each

Fairy
Pineapplin'
Games — £7.95 each

Introduction To Numbers
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Calculation 2
Memory
Reasoning
Reflexes
Educational — £9.95 each
P.I.C.A.S.S.O. — utility — £7.95

O

OCEAN SOFTWARE, 6 Central Street, Manchester M3 5FD
Hunchback — game — £6.90

P

PANASONIC (UK) LTD, 300-318 Bath Rd, Slough, Berks

Golf — game
Starship Simulator — game
Marine Battle — game
Breakout — game — £18.80
Highway Star — game
Squish 'em — game
MSX-21 — game
Tele-bunnies — game

PSS, 452 Stoney Stanton Rd, Coventry, CV6 5DG:

Champ — utility — £12.95
Maxima
Time Bandits
Les Flics
Games — £7.95 each

Q

QUICKSILVA, Liberty House, 222 Regent Street, London, W1R 4DB

Games Designer — utility — £9.95
Ant Attack
The Snowman
Fred
Booga-boo
Games — £7.95 each

S

SOFTCAT, Woodbridge Rd, Derby Green, Blackwater, Camberley, Surrey:

Let's go MSX
Challenge My Bluff
Kriss Kross Kquiz
Fun Words — educational — £9.95 each

SOFTWARE PROJECTS, Bear Brand Complex, Allerton Rd, Woolton, Liverpool, L25 7SF:

Manic Miner
Jet Set Willy
Games — £7.95 each

STELL SOFTWARE, 36 Limefield Ave, Whalley, Lancs

Maths Invaders — educational — £7.95

T

TERMINAL SOFTWARE, Derby House, Derby Street, Bury BL9 0NW

Lazy Jones — game — £8.95

TOSHIBA, Toshiba Hse, Frimley Rd, Frimley, Camberley, Surrey:

3D Golf
Polar Star
Pinball
Pyramid Warp
Battleship Clapton II
Games — £7.95 each

TASMAN, Springfield House, Hyde Terrace, Leeds, LS2 9LN:

Tasword — business — £13.90

V

VIRGIN GAMES, 2-4 Vernon Yard, Portobello Rd, London W11

Sorcery — game — £8.95

Super Store

Karl Dallas discovered some interesting facts about the new Sanyo disk drive

It is becoming more and more obvious that the real strength of MSX is not going to be in the slump-ridden and risky games market, but in that lucrative and still expanding sector where the sophisticated home user meets the small businessman. And now, with the impending release of another MSX disk drive, one can practically feel the format flexing its muscles and preparing for an assault on that area of the market.

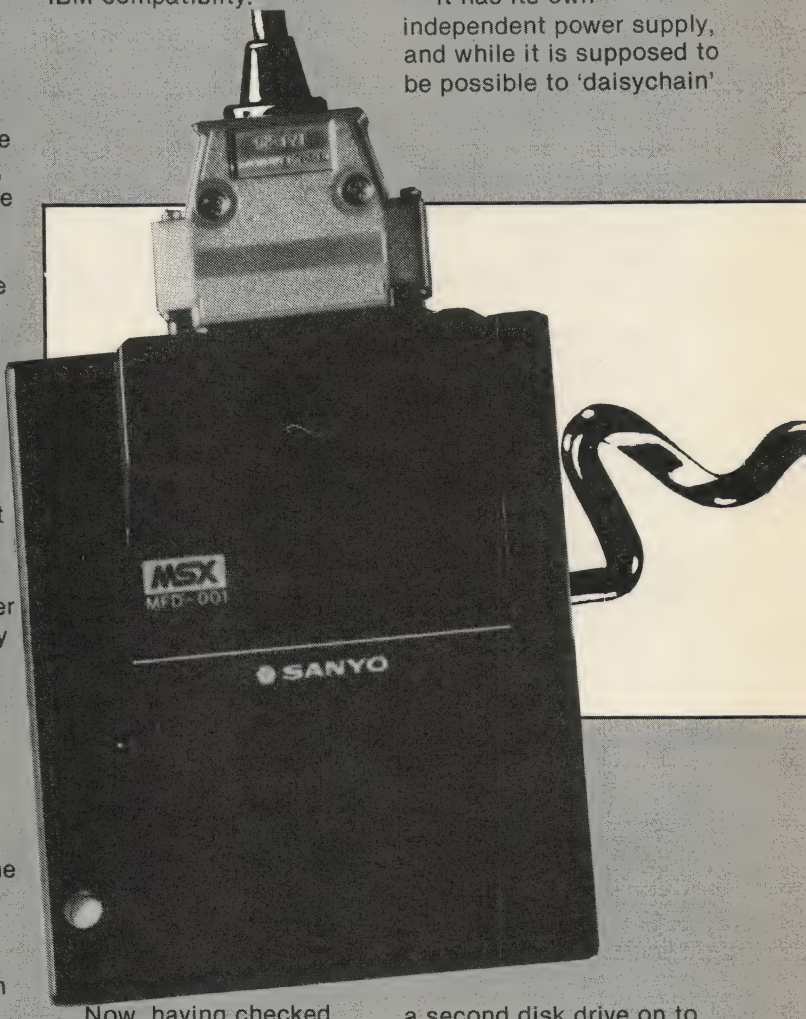
The interesting thing about this new drive from Sanyo is that it does not use the rather expensive 3½in format pioneered by Sony, but the popular 5¼in disks which are about half the price and obtainable in virtually every High Street computer store. But economy is only part of the story, and not necessarily the most significant part, as we shall see.

As is widely known by now, though MSX is a standard, it doesn't impose uniformity, and one of the places where the specification is silent is disk size: they can be 3in, 3½in, 5¼in, or even 8in in diameter. They have to be formatted in the same way, however, which means that though the 5½in disk is larger than the 5¼in format, it won't hold any more data.

And, of course, you can't slot a 3in disk into an 8in drive.

When I tested the Spectravideo MSX computer a few months back, it came complete with a 5¼in drive, but the company were unable to confirm whether they would be releasing that particular peripheral over here, or if they would stick with the 3½in format.

But the thing that struck me, even then, was the attractive possibility of IBM compatibilty.



Now, having checked out a soon-to-be-released commercial product in rather more detail, I can tell you that IBM compatibility is not just a possibility, it's a certainty. I know, because I have actually run IBM programs on my MSX machine, using this drive.

The unit

First, the unit itself. It is a rather bulky beast, measuring some 6in wide x 7in high x 10in deep. Its 'footprint' is therefore the same as the Sony drive, but it is nearly three times as tall. The disk interface is about threequarters of an inch deeper than the Sony's — and this is much bigger than I would actually like: It comes with MSX Disk Basic built into the interface ROM, and with MSX-DOS on an accompanying disk.

It has its own independent power supply, and while it is supposed to be possible to 'daisychain' a second disk drive on to the first one with MSX, and access them with the "A:" and "B:" drive-specific prefixes, there was no second socket to allow this to be done. However, unlike the Sony, it was possible to unscrew the lead from the interface, so perhaps some kind of Y-adaptor might make it possible.

As I have found in the past when trying to daisychain a Hitachi 3in drive to the Sony 3½in, it seems possible to link

together this 5¼in drive with Sony's 3½in — which would be useful for transferring files from the one disk format to the other. For that, apparently, you will need an RS232C interface in each, plus some controlling software like that included in Graham Knight's recent review of the Toshiba interface.

MSX Disk BASIC offers a number of new commands to the non-disk core of the language from Microsoft.

It also uses many of the same commands as regular MSX Basic, but it has to distinguish between tape and disk where SAVEing and LOADing commands are concerned, which will always direct themselves to the disk unit unless the prefix "CAS:" is included.

So the command:

LOAD "filename"

will get a file from disk, while to get the same file from tape you need to use either

LOAD "CAS:filename"

or

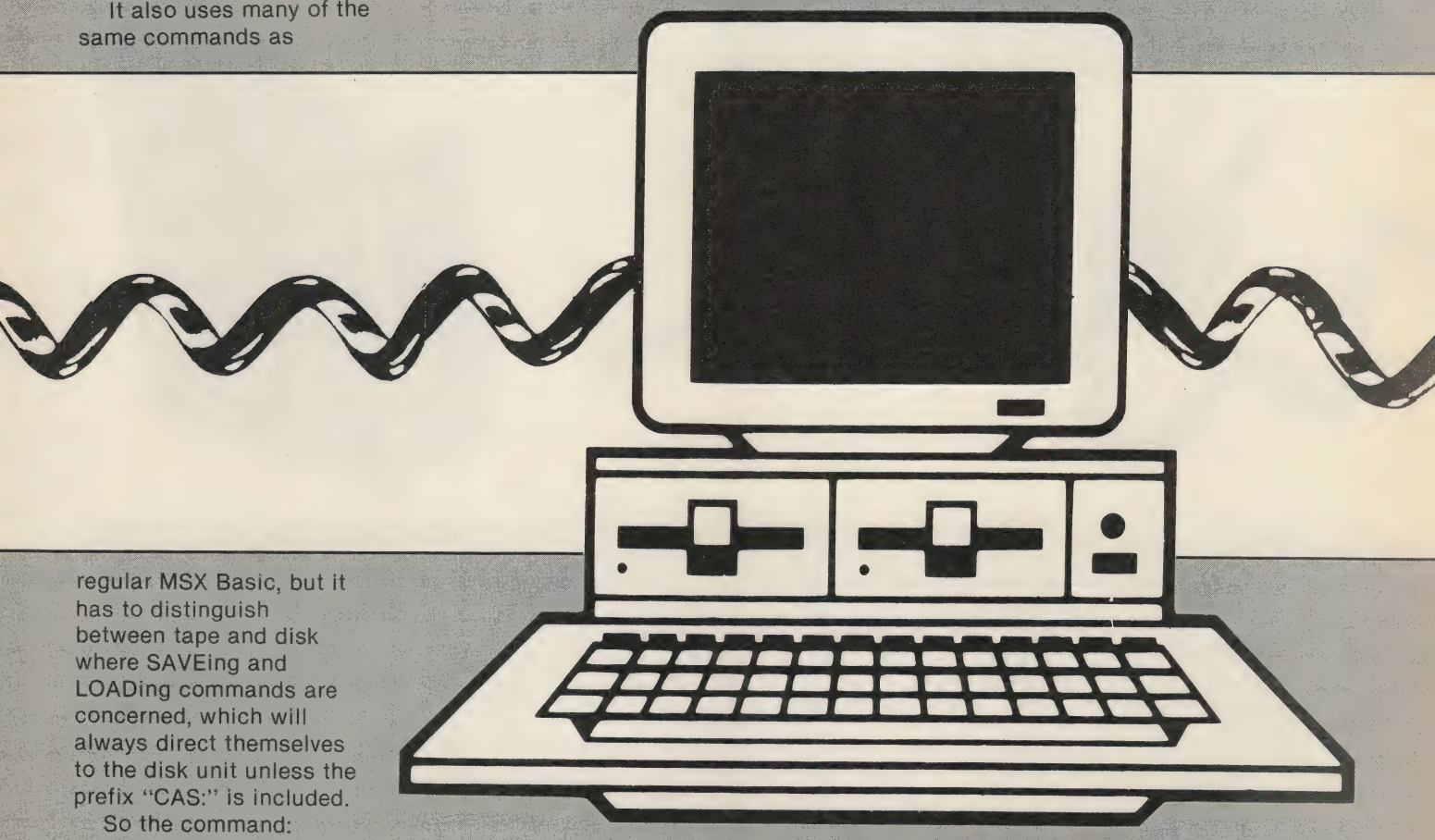
CLOAD "filename"

The BLOAD command will also work for machine language (binary) files, and again this will assume that disk is intended unless the "CAS:" prefix is employed. I included a detailed run-down of the Disk BASIC in my review of the Sony disk drive in the Decemeber issue.

Now what's all this about running IBM programs on an MSX machine?

It's true, it can be done, but of course not all programs.

Certainly not the real biggies, like Lotus 1-2-3, if only because you haven't got enough memory for them.



IBM compatibility

First, allow me to explain how it is even conceivable, which goes back to the fact that Microsoft, the people who devised MSX, also devised MS-DOS, which is one of the two operating systems used by the vastly popular IBM PC and its various look-alikes. MSX Basic is virtually identical with the version of Microsoft Basic used on the IBM, so if you can find a BASIC program written for the IBM, you stand a good chance of being able to key it into your MSX machine and expecting it to RUN as long as it doesn't use up too much memory, and as long as it doesn't include any routines which call up any of the machine's hardware specifics.

If this were all, it wouldn't be any big deal, because keying in long programs is something of a pain, and prone to error, as I'm sure you've discovered by now.

Once you get a disk drive, it immediately becomes much more interesting.

You'll remember that I said that a 5¼in disk doesn't hold any more data than a 3½in disk, because they are formatted identically. Well, this compatibility of format doesn't stop at the various MSX disk drives; disks formatted under IBM's MS-DOS also use the same format, so it is possible to read the directory of an Apricot (which also runs MS-DOS, though it uses 3½in disks) in a Sony MSX disk drive.

If the IBM or Apricot program is in BASIC, you can even LOAD it into your MSX machine, but it won't RUN, because it has been tokenised, and the way MSX interprets the tokens is different from the IBM. The TAB command comes out as MOTOR, for instance, which tends to generate syntax errors.

However, it is possible to change the way an IBM BASIC program is stored on disk so that it can be read and RUN by an MSX machine. You'll need access to an IBM machine to check out what follows, but believe me, it works.

First, LOAD BASIC into

the IBM (unlike MSX, which has BASIC in ROM, you have to LOAD BASIC from disk on the IBM and other MS-DOS machines) and then LOAD the program you'd like to run on the MSX machine. Then SAVE it again, but as an ASCII file.

This is done by adding an "A" after the SAVE command. It's also a good idea to change the filename extension, which will probably be ".BAS", to ".ASC", so you know it's in ASCII format. So if you have LOADed a program called "FILENAME.BAS",

you must reSAVE it on the IBM in ASCII format with the command

SAVE "FILENAME.ASC",A

Now comes the good bit.

If you now take that disk and put it in a Sanyo 5¼in MSX drive *it will run*, provided that you have not tried to play this trick with too sophisticated a program that uses machine-specific routines. Any program using pokes and peeks for instance, will certainly not RUN, though you'll be able to LOAD and LIST it, using the technigue I've described.

I actually tried this with the disk supplied with a handy volume, The IBM/PC Guide, published in the States by Banbury Books, but available in computer bookshops over here. This disk includes a lot of handy routines for most of the functions the IBM has in common with MSX, including some nice data file routines, and I found it quite easy to convert them to MSX format this way.

Of course, if you've had much experience with LOADing and SAVEing ASCII-format programs from tape, you'll know that because they haven't been compressed into tokenised format, ASCII files take much longer to LOAD. Even with the extra speed of disk, the difference in LOADing time is quite perceptible. Once back on MSX, you can speed things up by reSAVEing the program once more in tokenised form. LOAD it into memory, and then SAVE it with the command:

SAVE "FILENAME.BAS"

(SAVE it on another disk than your IBM original, of course, or it will over-write it, which then won't RUN on the machine it was originally written for).

Remember that if you have to borrow someone else's IBM software to do this you are in fact breaking the law. Keep it as an exercise, and you'll be OK: make sure you hand it all back (including the converted MSX disk) after you've finished.

The implications

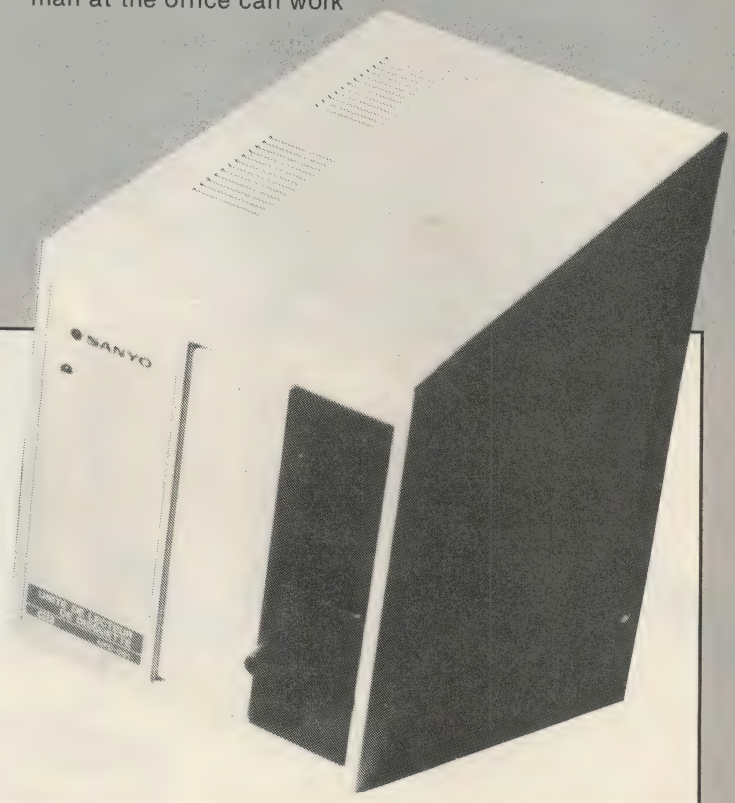
So far, of course, this is no more than a clever trick, but it has much wider implications, since MSX disk drives can also handle the data on IBM disks. This means your man at the office can work away on his office IBM, whip out the disks and bring them home to produce a word-processed report utilising the data produced by an office spreadsheet, say.

On an 80-column machine — and the Spectravideo MSX machine has an 80-column card option — it will be possible to run WordStar, which means that he'll be able to being a WordStar text disk from work, and continue working on it at home.

When lapheld MSX portables come on to the market he'll actually be able to work on his report on the train home, provided that he can get a seat, of course!

Everyone complains that MSX machines are too dear, and they're right, but wehn you consider that an MSX computer plus disk drive still costs less than half an IBM, you can see how economical business buyers will tend to opt for the much maligned 'home' machine especially those who don't need total power of the Big Blue, but want to be able to access data generated by the IBM.

This is the future, and believe me, it works.



Hardware verdict

Getting back to the specifics of the Sanyo drive, I found it just as nice to use as the Sony 3½in drive, though rather more bulky. SAVE and LOAD times were identical. Price is as yet uncertain, but if it is comparable, then until IBM finally decide to launch their long-awaited semi-portable with 3½in disk drives, this will be the favoured format for the user who wants to transport data disks back and forth between MSX and MS-DOS. And remember, 5¼in disks are cheaper.

Balloon Burst

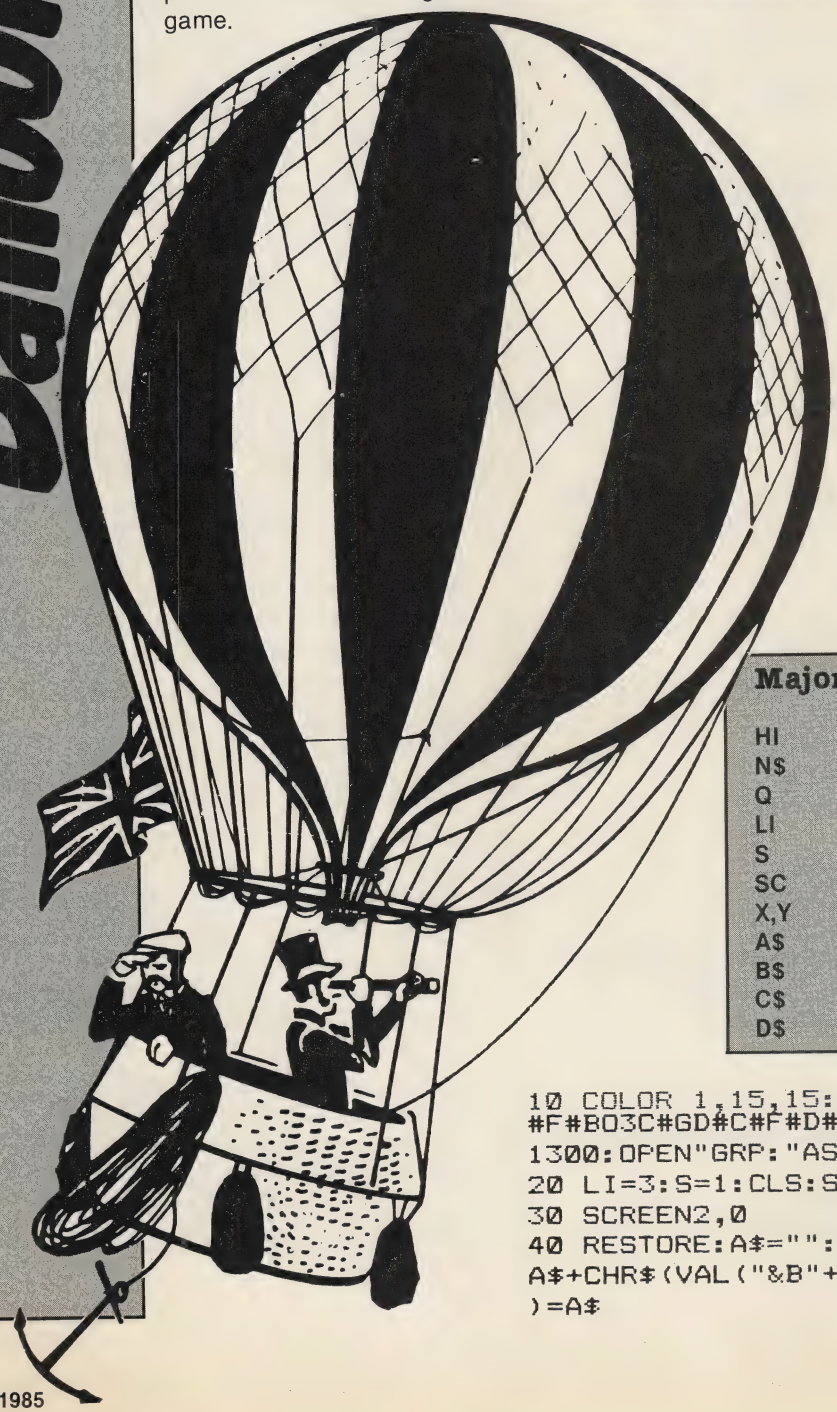
Your balloon is leaking and you still have a long way to go before you reach home in this arcade game by Robert Bonam of Shepshed, Leicestershire.

To complete each screen you must guide your balloon to the black cross without touching any of the obstacles. You get three lives with which to complete the four screens. The game can be played using either a joystick or the arrow keys.

Note: the CAPS LOCK must be set to the 'on' position before running the game.

Program breakdown

10-20	set variables and play tune
40-120	balloon sprite
130-190	draw screen
200-320	move balloon and check for collision
330-350	lose a life
360-370	next screen
380-520	screen 1 data
530-670	screen 2 data
680-820	screen 3 data
830-1130	screen 4 data
1140-1290	completed game
1300-1460	title screen and key input
1470-1700	instructions
1720-1900	end of game
1910-1950	draw border
1960-1990	demo routine



Major variables

HI	high score
N$	high score name
Q	direction variable
LI	lives
S	current screen number
SC	your score
X,Y	balloon co-ordinates
A$	mountain DATA
B$	house DATA
C$	factory DATA
D$	block of flats DATA

```
10 COLOR 1,15,15:KEYOFF:HI=0:PLAY"O2G
#F#BO3C#GD#C#F#D#O2BC#C#F#":Q=0:GOSUB
1300:OPEN"GRP:"AS#1:N$="M S X"
20 LI=3:S=1:CLS:SC=0
30 SCREEN2,0
40 RESTORE:A$="":FORF=0TO7:READD$:A$=
A$+CHR$(VAL("&B"+D$)):NEXTF:SPRITE$(0
)=A$
```

```
50 DATA 00001000
60 DATA 00011100
70 DATA 00111110
80 DATA 00111110
90 DATA 00010100
100 DATA 00010100
110 DATA 00011100
120  DATA 00011100
130 REM * SCREEN *
140 TIME=0
150 CLS
160 GOSUB1910
170 ONSGOSUB380,530,680,830,1140
180 DRAW"BM230,11C1R10D10L10U10F10L10
E10"
190 COLOR 15:PRESET(10,3):PRINT#1,"LI
VES = ";LI:PRESET(10,180):PRINT#1,"SC
ORE = ";SC
200 REM * MAIN LOOP *
210 ST=STICK(Q):IFST=0THEN250
220 IFST=1THENY=Y-1:GOTO260
230 IFST=3THENX=X+1:GOTO 260
240 IFST=7THENX=X-1:GOTO 260
250 Y=Y+1
260 PUTSPRITE0,(X,Y),3
270 IFPOINT(X,Y)=6THENGOTO 330
280 IFPOINT(X,Y)=1THENGOTO 360
290 X%=X+7:Y%=Y+8
300 IFPOINT(X%,Y%)=6THEN330
310 IFPOINT(X%,Y%)=1THEN360
320 GOTO 210
330 LI=LI-1:IFLI<1THEN1710
340 PLAY"O4L5CCCCD#DDCCCC":FORT=1TO10
0:NEXTT
350 GOTO130
360 IFTIME<3000THENSC=SC+3000-TIME
370 PLAY"O6DB":S=S+1:GOTO130
380 REM SCREEN 1
390 A$="E10F10H5G5"
400 LINE(0,100)-(100,108),6,BF:LINE(1
11,100)-(250,108),6,BF
410 LINE(111,0)-(119,30),6,BF:LINE(11
1,43)-(119,100),6,BF
420 DRAW"BM84,70C6XA$;"
430 FORT=30TO200STEP20
440 DRAW"BM=T;,165C6XA$;"
450 NEXTT
460 DRAW"BM70,50C6XA$;"
470 DRAW"BM40,68C6XA$;"
480 DRAW"BM18,60C6XA$;"
490 DRAW"BM220,40C6XA$;":DRAW"BM122,5
0C6XA$;":DRAW"BM142,40C6XA$;"
500 DRAW"BM165,33C6XA$;"
510 X=150:Y=130
520 RETURN
530 REM SCREEN 2
540 B$="R10H5G5D10R4U4R2D4R4U10D10L10
"
550 FORT=30TO230STEP11
560 DRAW"BM=T;,50C6XB$;"
570 NEXT
580 FORT=10TO220STEP11
590 DRAW"BM=T;,100XB$;"
600 NEXT
610 FORT=30TO230STEP11
620 DRAW"BM=T;,145XB$;"
630 NEXT
640 X=220:Y=160
650 DRAW"BM109,78XB$;":DRAW"BM130,70X
B$;":DRAW"BM160,78XB$;"
660 DRAW"BM109,128XB$;":DRAW"BM130,12
0XB$;":DRAW"BM160,128XB$;"
670 RETURN
680 REM SCREEN 3
690 LINE(30,50)-(45,190),6,BF
700 DRAW"BM32,25C6XB$;"
710 LINE(60,0)-(75,147),6,BF
720 DRAW"BM62,165XB$;"
730 LINE(90,50)-(105,190),6,BF
740 DRAW"BM92,25XB$;"
750 LINE(120,0)-(135,147),6,BF
760 DRAW"BM122,165XB$;
770 LINE(150,50)-(165,190),6,BF
780 DRAW"BM152,25XB$;"
790 LINE(200,0)-(230,100),6,BF
800 LINE(200,112)-(215,190),6,BF
810 X=15:Y=150
820 RETURN
830 REM SCREEN4
840 LINE(120,0)-(126,60),6,BF
850 X=200:Y=160
860 LINE(120,72)-(126,135),6,BF
870 LINE(120,147)-(126,190),6,BF
880 LINE(0,90)-(70,96),6,BF
890 LINE(80,90)-(250,95),6,BF
900 C$="U10R12U5R3D15L15"
910 DRAW"BM90,62XC$;"
920 DRAW"BM97,35XC$;"
930 DRAW"BM78,82XC$;"
940 DRAW"BM73,57XC$;"
950 DRAW"BM200,140XA$;"
960 DRAW"BM185,130XA$;"
970 DRAW"BM157,140XA$;"
980 DRAW"BM215,135XA$;"
990 DRAW"BM132,151XA$;"
1000 FORT=20TO115STEP11
1010 DRAW"BM=T;,156XB$;"
1020 NEXT
1030 DRAW"BM82,105XB$;"
1040 DRAW"BM60,105XB$;"
1050 DRAW"BM73,132XB$;"
1060 D$="U30R10D30L10U26BR3R3D3L3U3BD
5R3D3L3U3BD5R3D3L3U3BD5R3D3L3U3BD5R3D
3L3U3"
1070 DRAW"BM220,78XD$;"
1080 DRAW"BM205,46XD$;"
1090 DRAW"BM136,45XD$;"
1100 DRAW"BM136,87XD$;"
1110 DRAW"BM157,67XD$;"
1120 DRAW"BM188,82XD$;"
```

```
1130 RETURN
1140 REM END OF GAME GO BACK TO START
1150 SCREEN0:COLOR 1
1160 CLS
1170 PRINT"       WELL DONE BALLOONIST
 YOU HAVE"
1180 PRINT
1190 PRINT"       COMPLETED ALL FOUR S
CREENS"
1200 PRINT
1210 PRINT"       YOU HAVE SCORED"
1220 PRINT
1230 PRINT"            ";SC
1240 PRINT
1250 PRINT"       PRESS SPACE OR FIRE"
1260 PRINT
1270 PRINT"     FOR THE NEXT JOURNEY"
1280 S=1:IFSTRIG(Q)THENSCREEN2,0:GOTO
 40
1290 GOTO 1280
1300 COLOR 1:CLS
1310 PRINT"              BALLOON BURST"
:PRINT
1320 PRINT:PRINT:PRINT:PRINT:PRINT
1330 PRINT"              BY R.BONAM."
1340 PRINT
1350 K$="        'D' TO SEE SCREENS
   "
1360 X$="BALLOON BURST.....'S'
 TO START.....'J'  TO SET JOYSTIC
K.....'I' FOR INSTRUCTIONS."
1370 COLOR 1:J$=K$+X$
1380 FORT=1TOLEN(J$)
1390 LOCATE4,15:PRINTTAB(2);MID$(J$,T
,18)
1400 LOCATE4,15:FORK=1TO100:NEXT
1410 A$=INKEY$:IFA$=""THENNEXT
1420 IFA$="S"THENRETURN
1430 IFA$="J"THENQ=1
1440 IFA$="I"THEN1470
1450 IFA$="D"THEN1960
1460 GOTO 1380
1470 CLS
1480 PRINT"         BALLOON BURST"
1490 PRINT
1500 PRINT"   YOUR BALLOON AS BURST A
ND YOU"
1510 PRINT"   MUST TRAVEL THROUGH FOU
R "
1520 PRINT"   SCREENS OF TERROR TRYIN
G"
1530 PRINT"   TO KEEP IN THE AIR."
1540 PRINT
1550 PRINT"   TO COMPLETE A SCREEN YO
U "
1560 PRINT"   MUST LAND ON THE BLACK"
1570 PRINT"   CROSS IN THE TOP-RIGHT
"
1580 PRINT"   CORNER.":PRINT
1590 PRINT"   TOUCHING ANYTHING ELSE"
1600 PRINT"   RESULTS IN THE LOSS OF
A"
1610 PRINT"   LIFE.":PRINT
1620 PRINT"   BEWARE YOUR BALLOON STA
RTS"
1630 PRINT"   FALLING WHEN THE SCREEN
"
1640 PRINT"   IS DRAWN.":PRINT
1650 PRINT"         GOOD LUCK!"
1660 PRINT
1670 PRINT"      PRESS SPACE"
1680 A$=INKEY$:IFA$=""THEN1680
1690 IFA$<>" "THENTHEN1680
1700 CLS:GOTO 1380
1710 COLOR 1:SCREEN0
1720 CLS:PRINT"    YOU CRASHED BUT YO
U SCORED"
1730 PRINT:PRINT
1740 PRINT"                ";SC
1750 IFSC>HITHENGOSUB1850
1760 PRINT:PRINT
1770 PRINT"         THE HIGH SCORE IS"
1780 PRINT:PRINT
1790 PRINT"                "HI
1800 PRINT:PRINT"      BY:-  "N$
1810 PRINT:PRINT"    PRESS 'S'TO PLAY
 AGAIN"
1820 A$=INKEY$:IFA$=""THEN1820
1830 IFA$="S"ORA$="s"THENGOTO20
1840 GOTO1820
1850 PRINT"      A NEW HIGH SCORE":PR
INT
1860 PRINT"ENTER YOUR NAME":PRINT
1870 LINEINPUTN$
1880 IFLEN(N$)>15THENPRINT:PRINT"TOO
LONG":GOTO 1860
1890 HI=SC
1900 RETURN
1910 LINE(0,0)-(250,10),6,BF
1920 LINE(0,0)-(10,190),6,BF
1930 LINE(250,0)-(240,190),6,BF
1940 LINE(0,190)-(250,180),6,BF
1950 RETURN
1960 SCREEN2,0:CLS:D=1
1970 ONDGOSUB380,530,680,830
1980 IFD=5THENFORT=1TO1000:NEXT:CLS:S
CREEN0:GOTO1380
1990 GOSUB1910:D=D+1:FORT=1TO1000:NEX
T:CLS:GOTO 1970
```

Key Notes

Turn your computer into a keyboard instrument with this program by Gillian Baskett of Stafford.

The number of keys give a range spanning slightly more than an octave in the key of G. Number 1 is C (octave 4) and number 0 is E (octave 5), and Gillian has included four simple tunes to help you on your way.

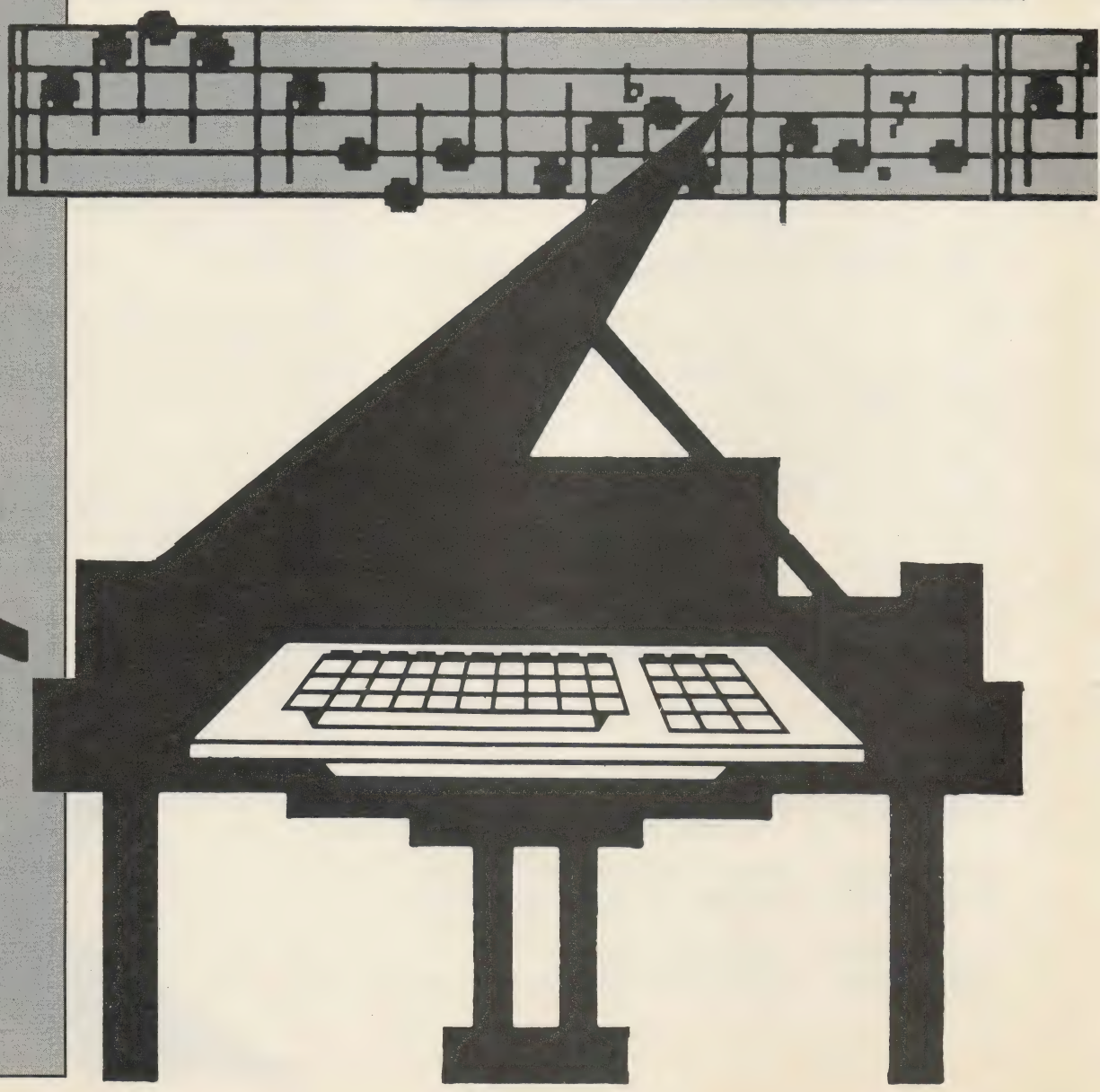
The program also includes a choice of four different instruments, and by changing the values of s and m in lines 400 — 430 you can easily create new sounds of your own.

Major variables

B$	current note being played
C$,D$,E$,F$	DATA for the four tunes
Z	number of chosen tune
ZZ	number of chosen instrument

Program breakdown

50	plays a short tune and sets note length to 6
60-200	sets up variables and strings
210-350	displays menus to select tune and instrument
360-380	prints tune for you to play
390-430	selects values of s and m depending on ZZ
440-590	detects if a number key has been pressed and selects the corresponding note from B$
600-780	displays the words with their related note numbers for the selected tune



```
10 CLS
20 PRINT"**** Musical Numbers ****"
30 PRINT:PRINT"*** by Gillian Baskett
 ***"
40 KEY OFF
50 PLAY "16o4cegfedc"
60 DIM C$(32),D$(32),E$(32),F$(32)
70 FOR X=0 TO 9:READ B$(X):NEXT
80 DATA "o5e","o4c","o4d","o4e","o4f+
","o4g","o4a","o4b","o5c","o5d"
90 FOR X=1 TO 32:READ C$(X):NEXT
100 DATA 7 One,7 man,7 went,7 to,7 mo
w,,,,,7 went,7 to,8 mow,7 a,7 mead-  ,
6 ow,,
110 DATA 6 one,6 man,6 and,6 his,6 do
g,,,,,9 went,9 to,9 mow,8 a,7 mead-  ,
5 ow,,
120 FOR X=1 TO 32:READ D$(X):NEXT
130 DATA 5 Bob-,5 by,5 Shaf-,8 to's
    ,7 gone,9 to,7 sea,5 --,2 Sil-,2
ver,2 buck-,5 les,4 on,6 his,4 knee,2
 --
140 DATA 5 He'll,5 come,5 back,8 and
    ,7 mar-,9 ry,7 me,5 --,6 Bon-,8 n
y,6 Bob-,4 by,5 Shaf-,5 to,,
150 FOR X=1 TO 32:READ E$(X):NEXT
160 DATA 9 This,7 old,9 man,9 he,7 pl
ayed 9 one,,,,,0 He,9 played,8 nick-,7
 nack     ,6 on,7 my,8 drum,
170 DATA 9 Nick-,5 nack,5 5 5 paddywa
ck    ,5 give,6 a,7 dog,8 a,9 bone,9 T
his,6 old,6 man,8 came,7 roll-6 ing,5
 home,,
180 FOR X=1 TO 32:READ F$(X):NEXT
190 DATA 2 There,5 was  5 an,5 old,5
man ,7 called,9 Mich-  9 ael,7 Fin-
   6 ni-,5 gan,6 He,6 grew,6 whis-,6
kers,4 on,6 his,4 chin-  3 ni-,2 gin
200 DATA 2 The  5 wind,5 came,5 up,7
and ,9 blew,9 them,7 in-  6 i-,5 gin,
6 Poor,6 old,2 Mich-,4 ael,5 Fin-5 -n
i-,5 gan,(5 Be-  5 gin-,5 i-  5 gin)
210 '****** Choices table ***********
220 PRINT:PRINT:PRINT"    CHOICE OF T
UNES"
230 PRINT:PRINT"1 One man went to mow
"
240 PRINT:PRINT"2 Bobby Shafto"
250 PRINT:PRINT"3 This old man"
260 PRINT:PRINT"4 Michael Finnigan"
270 PRINT:PRINT:PRINT"5 End"
280 PRINT:PRINT:INPUT"Press the numbe
r of the tune you want";Z
290 IF Z=5 THEN PRINT"Thank you for t
he tunes":END
300 PRINT:PRINT:PRINT"SOUNDS"
310 PRINT:PRINT"1 Bell"
320 PRINT:PRINT"2 Vibrato"
330 PRINT:PRINT"3 Wind"
340 PRINT:PRINT"4 Piano"
350 PRINT:INPUT"Press the no.of the s
ound you prefer";ZZ
360 GOTO 610
370 LOCATE 0,20
380 PRINT"Press <space bar> to choose
 another  tune"
390 ' ****** Set up sounds ******
400 IF ZZ=1 THEN PLAY"s0m22255"
410 IF ZZ=2 THEN PLAY"s10m232"
420 IF ZZ=3 THEN PLAY"s13m2000"
430 IF ZZ=4 THEN PLAY"s10m3750"
440 ' **** Play notes from numbers **
450 AA$=INKEY$
460 IF AA$="1" THEN X=1:GOTO 580
470 IF AA$="2" THEN X=2:GOTO 580
480 IF AA$="3" THEN X=3:GOTO 580
490 IF AA$="4" THEN X=4:GOTO 580
500 IF AA$="5" THEN X=5:GOTO 580
510 IF AA$="6" THEN X=6:GOTO 580
520 IF AA$="7" THEN X=7:GOTO 580
530 IF AA$="8" THEN X=8:GOTO 580
540 IF AA$="9" THEN X=9:GOTO 580
550 IF AA$="0" THEN X=0:GOTO 580
560 IF AA$=" " THEN CLS:GOTO 210
570 GOTO 450
580 PLAYB$(X)
590 GOTO 450
600 '**** Print words & numbers *****
610 CLS:PRINT:PRINT:FOR X=1 TO 8
620 GOSUB 740
630 NEXT
640 PRINT:PRINT:FOR X=9 TO 16
650 GOSUB 740
660 NEXT
670 PRINT:PRINT:FOR X=17 TO 24
680 GOSUB 740
690 NEXT
700 PRINT:PRINT:FOR X=25 TO 32
710 GOSUB 740
720 NEXT
730 GOTO 370
740 IF Z=1 THEN PRINTC$(X);SPC(2);
750 IF Z=2 THEN PRINTD$(X);SPC(2);
760 IF Z=3 THEN PRINTE$(X);SPC(2);
770 IF Z=4 THEN PRINTF$(X);SPC(2);
780 RETURN
```

MSX

Sounds

Mr A gilbert of Southampton has written this listing to enable the user to experiment with the sound registers.

After the instructions, the screen display shows the fourteen sound chip registers. After positioning the pointer under the desired register it can be incremented or decremented. This may be done either in single steps using the up/down arrow keys or in whole numbers after pressing the space bar. Only legal values are accepted and there is immediate feedback on the effect of altering a register.

As a tutor it should help the user understand the effect of each sound register, something many people find difficult.
As a utility it can be used to create special sound effects for future use.

After giving instructions the program goes on to define a sprite from the character set. The program then enters the main data read-in loop. An ON INTERVAL routine updates the sound registers every half second.

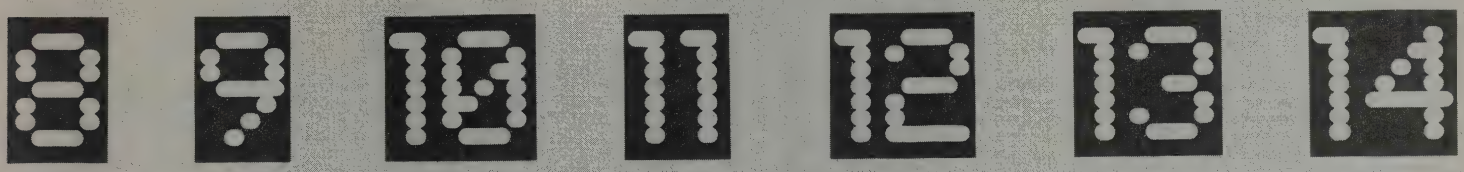
A feature of this program which might be of interest is the method of using REM s to display instructions. This is done by VPOKING the character colour codes to change the number set to background colour and, thus making them invisible in the listing. Also this allows more than the usual number of colours in both screen one and in listings.

Graphics used in line 650 — GRAPH key with R,Y and minus sign.

Major variables

AX,AY	sprite position
P,PP	screen display for registers
SV%	upper limit for register value
DV%	register value
RN%	register number
K	keyboard read in

```
10 '********************
20 '* SOUND GENERATOR *
30 '*(c)copyright      *
40 '*                  *
50 '* A GILBERT. 1985 *
60 '*                  *
70 '********************
80 CLEAR255
90 '***   INITIALIZE   ***
100 DIMA%(14):DIMDV%(30):DIMRN%(14):D
IMSV%(14)
110 FORN=0TO13:DV%(N)=-1:NEXT
120 SCREEN1,1,0:COLOR1,13,13:KEYOFF:C
LS:WIDTH30
130 GOTO890
140 '***   GOSUB TO DEFINE SPRITE   *
**
150 SCREEN1,1,0:CLS:COLOR1,13,5:WIDTH
30
160 GOSUB800
170 LOCATE0,10:PRINT"MIX"
180 LOCATE5,10:PRINT"A   B   C"
190 LOCATE19,10:PRINT"VOLUME":LOCATE1
9,11:PRINT"PATTERN"
200 LOCATE7,11:PRINT"VOLUME"
210 '***   FIRST SCREEN DISPLAY   ***
220 LOCATE24,23:PRINT"WHITE"
230 LOCATE24,24:PRINT"NOISE"
240 LOCATE8,24:PRINT"CHANNELS"
250 X=2:Y=20:FORM=1TO3
260 READD$:LOCATEX,Y:PRINT"<";D$;">";
270 X=X+8:NEXTM
280 DATA"A","B","C"
290 Y=16:YA=0:M=14:YB=24:YC=4:AX=10:A
Y=135:A=0:SL=208:BX=0:PP=14
300 FORB=0TO13:READD:SV%(B)=D:NEXTB
310 DATA255,15,255,15,255,15,31,63,16
,16,16,255,255,14
320 FORN=YATOYBSTEPYC
330 LOCATEN,Y,0:PRINTA;
340 A=A+1
350 NEXTN
360 IFY=16THENY=5:GOTO320
370 '***   MAIN LOOP FOR DATA READ IN
   ***
380 IFAXMOD(33)=10THENCL%=11ELSECL%=4
390 PUTSPRITE1,(AX,AY),CL%,1
400 K$=INKEY$:IFK$=""THEN400
```



```
410 K=ASC(K$):IFK=28THENAX=AX+33
420 IFAX>208ANDPP=12THENAX=10:AY=40:B
X=241:M=3:PP=3:GOTO380
430 IFK=29THENAX=AX-33:IFAX<10ANDBX=2
41THENAX=208:AY=135:BX=0:PP=14:M=14
440 IFPP=3ANDAX>208THENAX=208
450 IFAX<10ANDAY=135THENAX=10
460 XX=AX+BX
470 RN%=INT(XX/33)
480 IFXX=10THENRN%=0
490 IFCL%=11ANDK=30THENDV%(RN%)=DV%(R
N%)+1
500 IFCL%=11ANDK=31THENDV%(RN%)=DV%(R
N%)-1
510 P=INT(AX/8.5)
520 IFRN%<2THENP=P-1
530 IFRN%=7THENP=P-1
540 IFRN%=9THENP=P+1
550 IFK=32ANDCL%=11THEN560ELSE580
560 LOCATE0,0,0:INPUT"NUMBER FOR THIS
 REGISTER";B$:A1=VAL(B$)
570 DV%(RN%)=A1
580 IFDV%(RN%)<-1THENDV%(RN%)=-1
590 IFRN%>7ANDRN%<10THENP=P-1
600 IFRN%/2=INT(RN%/2)THENPP=M-2
610 IFRN%/2<>INT(RN%/2)THENPP=M
620 IFDV%(RN%)>SV%(RN%)THENDV%(RN%)=S
V%(RN%)
630 IFDV%(RN%)=-1THENLOCATEP+1,PP:PRI
NT"OFF":GOTO650
640 LOCATEP,PP:PRINTDV%(RN%);SPC(3)
650 LOCATEP+1,PP+1:PRINT"XWY"
660 LOCATE0,0,0:PRINTSPC(29)
670 '***   INTERUPT TO UPDATE SOUND R
EGISTERS   ***
680 ONINTERVAL=5GOSUB730
690 INTERVALON
700 GOTO380
710 END
720 '***   LOOP TO GENERATE SOUND   *
**
730 FORN=0TO13
740 IFDV%(N)<-1THENDV%(N)=-1:GOTO770
750 IFDV%(N)=-1THENGOTO770
760 SOUNDN,DV%(N)
770 NEXTN
780 INTERVALOFF:RETURN
790 '***   DEFINE SPRITE   ***z
800 A%=BASE(7)+ASC("N")*8
810 A$=""
820 FORN=0TO7
830 C=VPEEK(A%+N):A$=A$+CHR$(C)
840 NEXTN:SPRITE$(1)=A$
850 IFPP=15THEN700
860 A%=BASE(6)+2:VPOKEA%,&H3D
870 VPOKEBASE(6)+6,&HFD:VPOKEBASE(6)+
7,&HFD
880 RETURN
890 COLOR1,5,5:CLS
900 A%=BASE(6)
910 VPOKEA%+6,&H55:VPOKEA%+4,&H55:VPO
KEA%+5,&HF5:VPOKEA%+7,&H55
920 LOCATE5,2:PRINT"The instructions
for"
930 LOCATE0,4:PRINT"SOUND GENERATOR s
croll in the"
940 LOCATE0,6:PRINT"same way as listi
ngs. Use the"
950 LOCATE3,8:PRINT"stop button to ho
ld and"
960 LOCATE7,10:PRINT"release scroll"
970 KEY1,"goto140"+CHR$(13)
980 LOCATE3,16:PRINT"PRESS SPACE BAR
TO START"
990 K$=INKEY$:IFK$=""THEN990
1000 IFK$=" "THENLIST1010-ELSEGOTO990
1010 '
1020 '
1030 '
1040 '
1050 '
1060 '
1070 '
1080 '       ****
1090 '       ****                Use th
e left/right arrow keys to move the y
ellow pointer to the desired register
 number, (below the green line.) then
 increase or decrease register value
(above green line.) with the up/down
arrow keys.
1100 '       ****                If gre
ater alterations are desired this is
done by pressing SPACE BAR the requir
ed value can now be entered followed
by RETURN. Illegal values are ignored
 and the register is then set to its
highest permitted VALUE.
1110 '       ****                To mov
e between top and bottom row move rig
ht through six or left through seven.
 Registers not required in a sound sh
ould be set to zero. To read listing
type SCREEN 1 first to restore line n
umbers.
1120 '       ****                The so
und is heard continuously during alte
ration and may be heard in short burs
ts by moving the left/right arrow key
s. WAIT for a moment after changing v
alues to allow time for register upda
te and feedback on the effect.
1130 '       ****                As on
screen information is limited you sho
uld consult your user manual for deta
ils of sound register functions. Reme
mber if all volume channels eight to
ten are off no sound is heard. '
1140 '
1150 '
1160 '* PRESS F1 TO START *
```

MSX

Sketch Pad

Here is a paintbox which enables you to guide a pencil sprite around the screen using either the cursor keys or a joystick.

The pencil can be raised so that no line is produced when relocating it, its colour can be changed, as can the colour of the background, and areas can be filled.

To fill an area with colour, draw your boundary and raise the pencil. Then move the pencil within the boundary but do not change its colour and press F5. If there is a break in the boundary the colour will leak and wipe out your drawing, so take care.

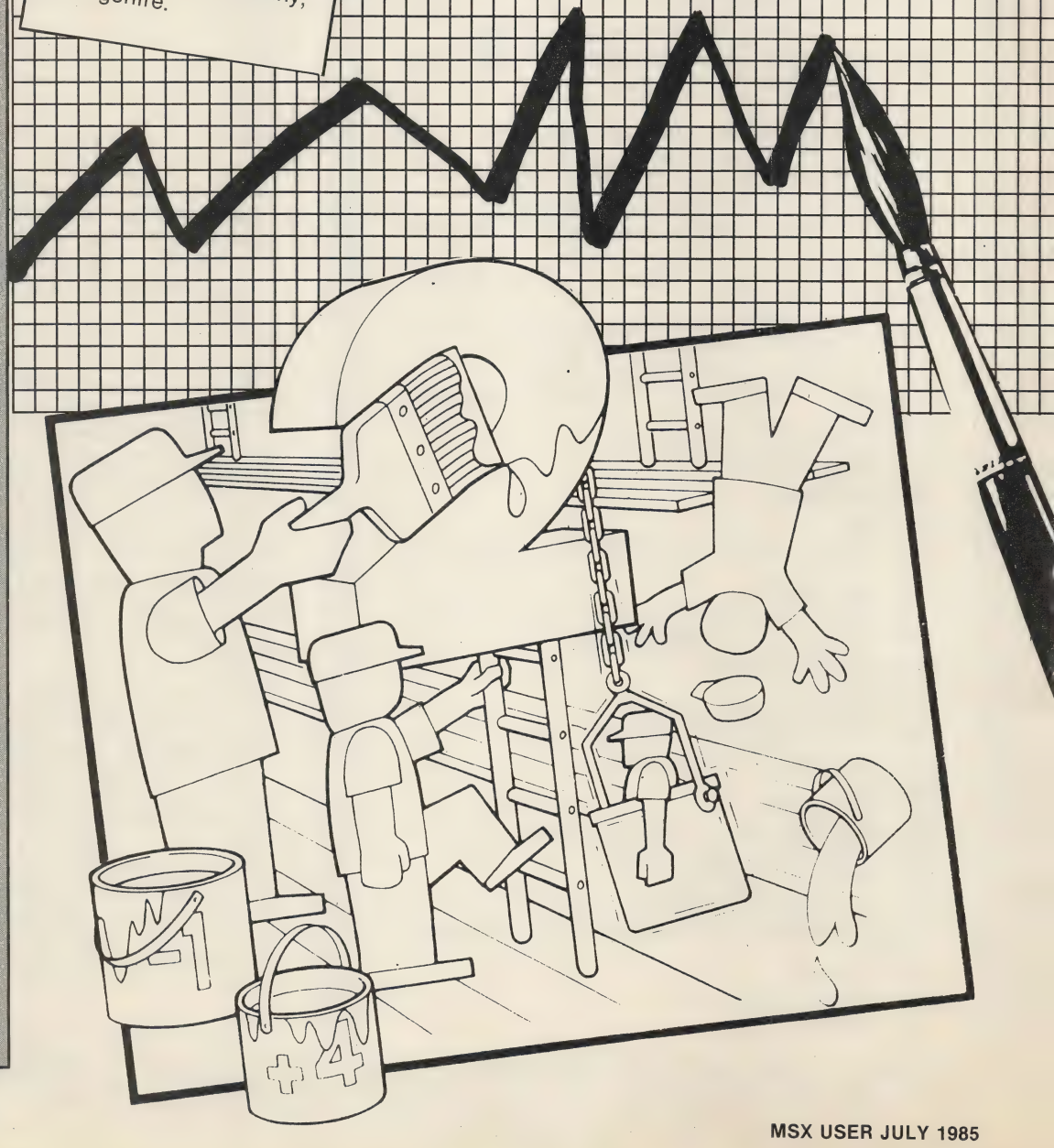
Sketch Pad was devised by Andrew Hay of Denny, Stirlingshire.

Program breakdown

10	initialise program
30-140	print instructions
150-160	enable function key interrupts
170-180	define pencil sprites
190	set variables
200-270	main loop
280-350	function key subroutines
370-540	move sprite subroutines

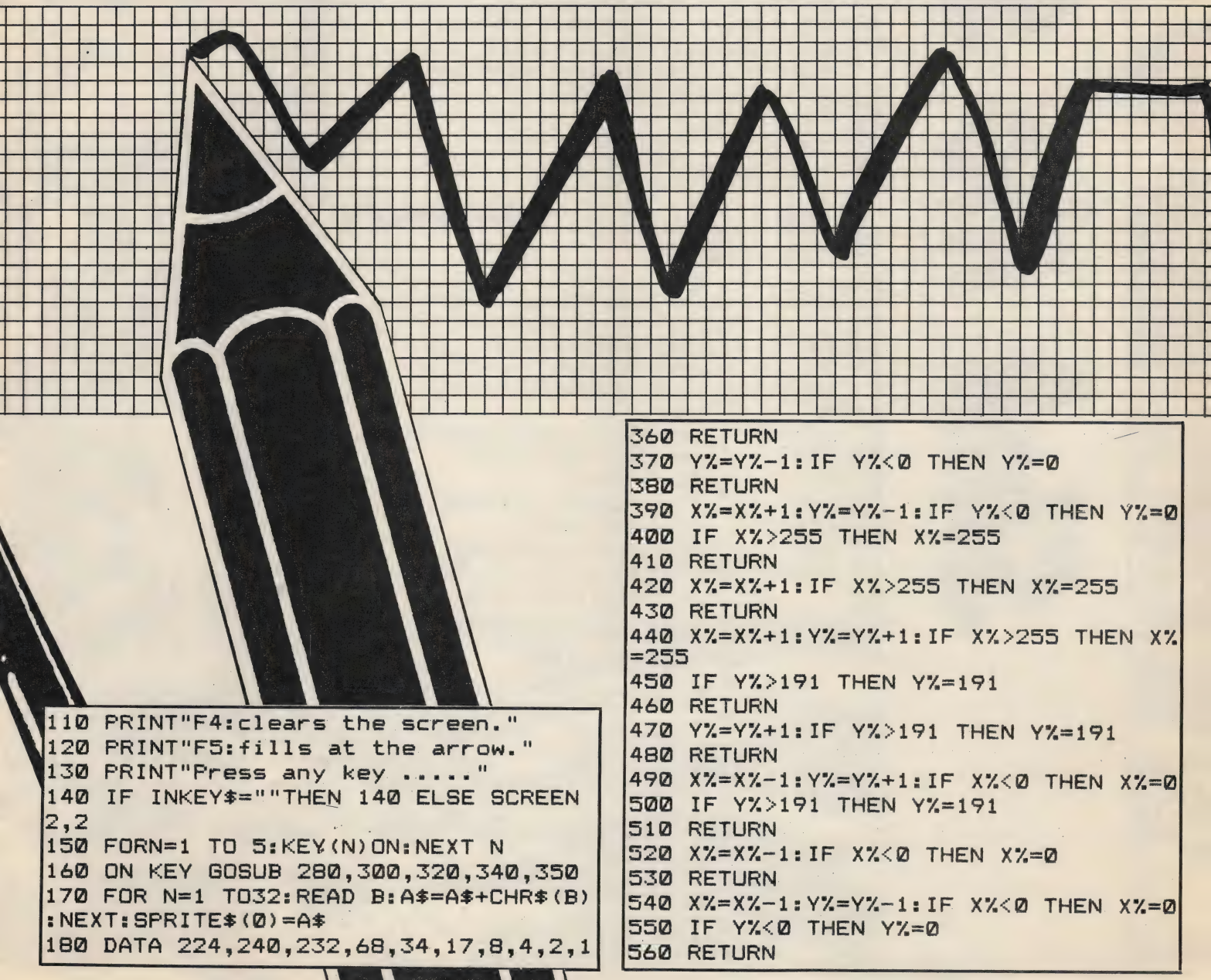
Main variables

X%	x co-ordinate of pencil sprite tip
Y%	y co-ordinate of pencil sprite tip
C%	background colour
I%	foreground colour
M%	flag for pen up or pen down



```
10 COLOR 15,1,1:KEY OFF:SCREEN 1
20 REM **** USER INSTRUCTIONS ***
30 LOCATE 0,0:PRINT"COMPUTER CANVAS b
y Andrew Hay"
40 LOCATE 0,3:PRINT"The controls are
as follows:":PRINT
50 PRINT"The cursor keys or joystick
 move the pencil round the    screen.
":PRINT
60 PRINT"The pixel at the pencil poin
tis normally set in the        current
 colour.":PRINT
70 PRINT"The funtion keys do the
 following:":PRINT
80 PRINT"F1:switches between draw/mov
emode"
90 PRINT"F2:changes foreground colour
"
100 PRINT"F3:changes background colou
r"
```

```
,0,0,0,0,0,0,0,0,0,0,0,0,128,64,32,16
,136,68,34,17,10,4
190 C%=1:I%=15:X%=127:Y%=96:M%=1
200 COLOR I%,C%,C%
210 PUT SPRITE 0,(X%,Y%),I%,0
220 IF M%=1 THEN PSET(X%,Y%),I%
230 FOR N=0 TO 2
240 S=STICK(N)
250 ON S GOSUB 370,390,420,440,470,49
0,520,540
260 NEXT N
270 GOTO 200
280 IF M%=0 THEN M%=1:RETURN
290 IF M%=1 THEN M%=0:RETURN
300 I%=I%+1:IF I%=16 THEN I%=1
310 RETURN
320 C%=C%+1:IF C%=16 THEN C%=1
330 RETURN
340 CLS:RETURN      080884
350 PAINT(X%,Y%),I%
```



```
110 PRINT"F4:clears the screen."
120 PRINT"F5:fills at the arrow."
130 PRINT"Press any key ....."
140 IF INKEY$=""THEN 140 ELSE SCREEN
2,2
150 FORN=1 TO 5:KEY(N)ON:NEXT N
160 ON KEY GOSUB 280,300,320,340,350
170 FOR N=1 TO32:READ B:A$=A$+CHR$(B)
:NEXT:SPRITE$(0)=A$
180 DATA 224,240,232,68,34,17,8,4,2,1
```

```
360 RETURN
370 Y%=Y%-1:IF Y%<0 THEN Y%=0
380 RETURN
390 X%=X%+1:Y%=Y%-1:IF Y%<0 THEN Y%=0
400 IF X%>255 THEN X%=255
410 RETURN
420 X%=X%+1:IF X%>255 THEN X%=255
430 RETURN
440 X%=X%+1:Y%=Y%+1:IF X%>255 THEN X%
=255
450 IF Y%>191 THEN Y%=191
460 RETURN
470 Y%=Y%+1:IF Y%>191 THEN Y%=191
480 RETURN
490 X%=X%-1:Y%=Y%+1:IF X%<0 THEN X%=0
500 IF Y%>191 THEN Y%=191
510 RETURN
520 X%=X%-1:IF X%<0 THEN X%=0
530 RETURN
540 X%=X%-1:Y%=Y%-1:IF X%<0 THEN X%=0
550 IF Y%<0 THEN Y%=0
560 RETURN
```

MSX

Sink the Ship

This is a logic game for children. The idea is for the child to work out the computer's number. There are four levels of play to suit the child's ability.

The program starts with instructions and a graphic display of a fort and a ship. The user is the fort and if he guesses the computer's number correctly his shell will blow up the ship. If the computer gets the user's number first it will blow up the fort. Clues are given as to whether the shell over or undershot, along with a suitable graphic display.

A point of interest is the routine to obtain an input on the high-res screen, which is not normally possible.

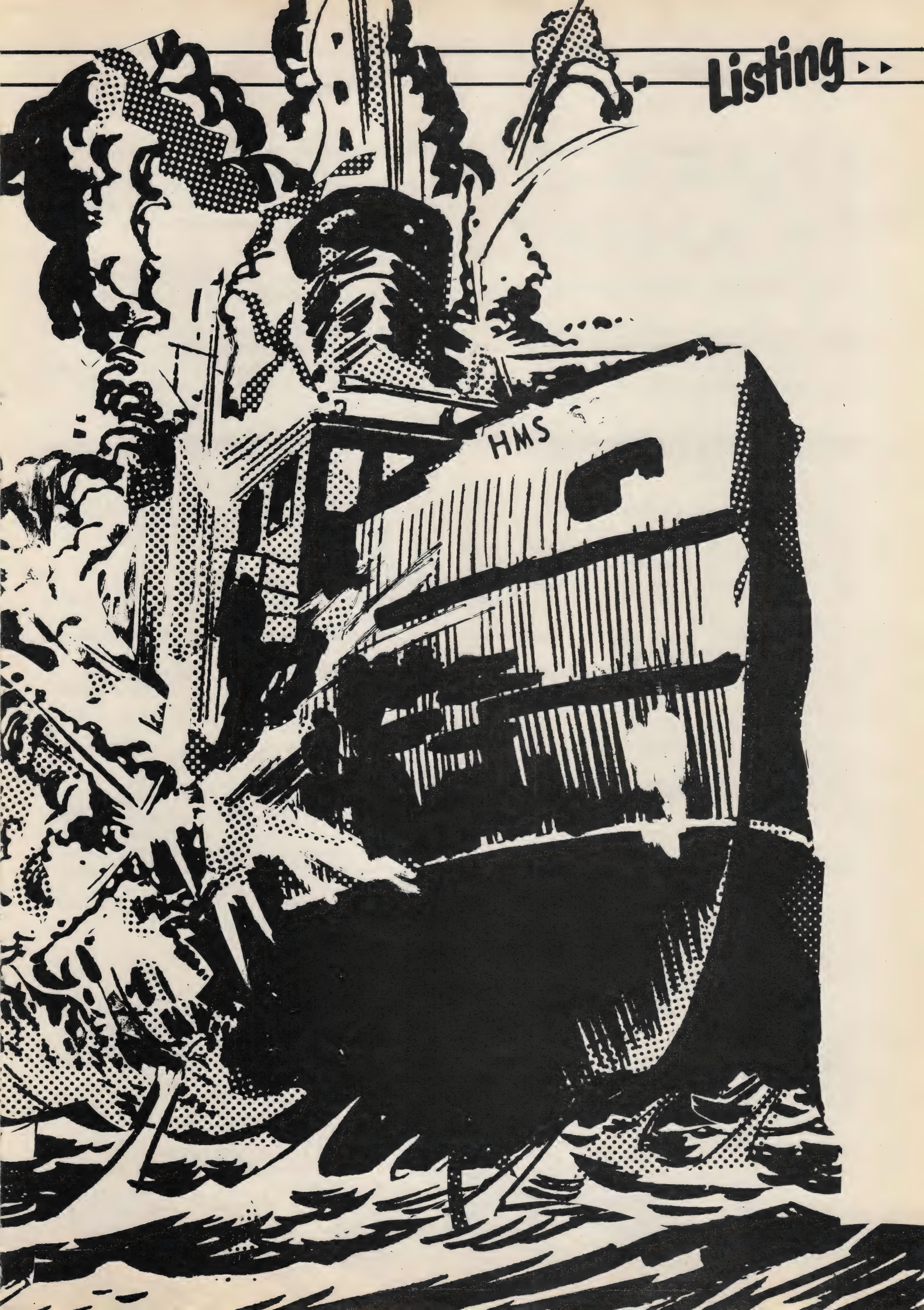
The program was written by D. Shaw of Derby.

Program breakdown

10-80	set up routines
90-200	input on high-res screen
210-260	check user's guess
270-360	explosion on ship
370-510	logic to work out computers guess
520-600	print computer's guess
610-670	fort explosion
680-780	shell from fort to ship
790-900	shell from ship to fort
910-1020	explosion sound
1030-1160	end routine/offer new game
1180-1440	initial input routines
1450-2060	set up graphics and sprites
2070	initialise variables
2100	tune
2110-2360	instruction routines
2370-2460	space bar routines
2470-2520	data for sprites

Main variables

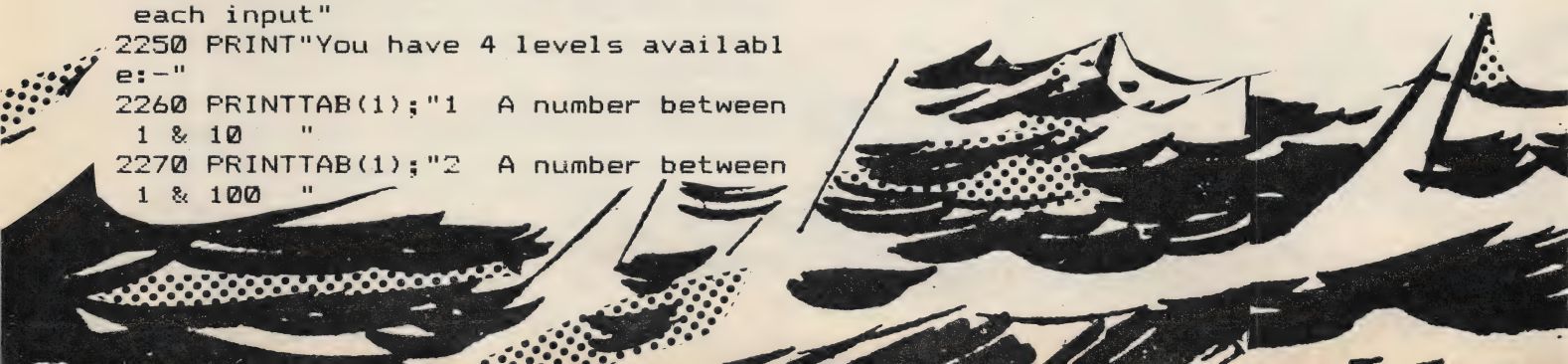
A$-E$	temporary variables — used in input routines and sprite set up
NA$	holds user's name
G%	plane movement
R%,S$	bird's movement
T%	tune
X%,Y%,Z%	system flags and temporary variables
TRY%	number of user's guesses
GU%	user's guess
UN%	user's number for computer to guess
CG%	computer's guess
NBR	computer's random number
H,L,M,N,O,P,V	variables used for shell flight and computer's logic guesses


HMS

```
10 'SINK THE SHIP by M.D.SHAW.
20 'PRODUCED MARCH 1985.
30 'AN EDUCATIONAL LOGIC GAME.
40 CLEAR500
50 GOSUB 2070:REM SET UP ROUTINE
60 GOSUB 1200:REM INPUT LEVEL
70 GOSUB 1470:REM GRAPHICS
80 GOSUB2420
90 PSET(0,160):COLOR8:PRINT#1,"WHAT I
S YOUR GUESS"
100 IF INKEY$<>""THEN 100
110 T=150:S=160
120 FOR F=0 TO 3
130 A$(F)=INPUT$(1)
140 IFA$(F)=CHR$(13) THEN F=3
150 IFA$(F)=CHR$(8) THEN A$(F)="":LIN
E(0,160)-(255,168),7,BF:F=3:GOTO90
160 DRAW"BM"+STR$(T)+","+STR$(S)
170 PRINT#1,A$(F)
180 T=T+8:NEXT
190 X$=A$(0)+A$(1)+A$(2)+A$(3)
200 GU%=VAL(X$)
210 IF GU%<NBR THEN H=128:V=117:L=-10
:M=0:N=55:P=5:GOSUB790
220 IF GU%<NBR THEN PSET(0,160):PRINT
#1,"  SORRY THAT WAS TOO LOW!!!":GOTO
 390
230 IF GU%>NBR THEN H=137:V=205:L=-14
:M=-2:N=50:P=4:GOSUB790
240 IF GU%>NBR THEN PSET(0,160):PRINT
#1,"  SORRY THAT WAS TOO HIGH!!!":GOT
O 390
250 IF GU%=NBR THEN H=137:V=200:L=-12
:M=-5:N=5:P=5:GOSUB790
260 GOSUB930
270 FOR F=1 TO25
280 X=INT(RND(1)*250):IFX<150 GOTO 28
0
290 Y=INT(RND(1)*120):IF Y<100 GOTO 2
90
300 COL=INT(RND(1)*11):IF COL<4 OR CO
L>11 THEN GOTO 300
310 LINE(200,130)-(X,Y),COL:NEXT
320 FORF=116 TO 132
330 IF F=125 THEN LINE(150,100)-(250,
131),7,BF
340 PUT SPRITE3,(185,F),1,3
350 PUT SPRITE4,(201,F),1,4
360 FOR X=1TO50:NEXTX:NEXT F
370 GOSUB 2420
380 GOTO 1030
390 GOSUB 2420
400 IF Z%=1 THEN GOTO 500
410 IF X%=0 THEN GOTO 460
420 H%=L%:L%=L%/2
430 IF L%=UN% THEN CG%=L%:GOTO 510
440 IF L%>UN% THEN CG%=L%:X%=1:GOTO 5
10
450 IF L%<UN% THEN CG%=L%:X%=0:GOTO 5
10
460 N%=(H%-L%)/2:N%=N%+L%
470 IF N%>UN% THEN H%=N%:GOTO 490
480 L%=N%
490 CG%=N%
500 Z%=0
510 LINE(0,160)-(255,168),7,BF
520 PSET(15,15):PRINT#1,"  MY GUESS I
S "CG%
530 IF CG%<UN% THEN H=125:V=-80:L=9:M
=-8:N=8.5:P=110:GOSUB690
540 IF CG%<UN% THEN PSET(25,25):PRINT
#1,"OH DEAR TOO LOW!!!":GOSUB 2420
550 IF CG%<UN% THEN GOTO 90
560 IF CG%>UN% THEN H=86:V=-80:L=9.5:
M=-8.25:N=10:P=110:GOSUB690
570 IF CG%>UN% THEN PSET(25,25):PRINT
#1,"OH DEAR TOO HIGH!!!":GOSUB 2420
580 IF CG%>UN% THEN GOTO 90
590 IF CG%=UN% THEN H=101:V=-69:L=9.5
:M=-8.25:N=10:P=110:GOSUB690
600 GOSUB930
610 FOR F=1 TO25
620 X=INT(RND(1)*100)
630 Y=INT(RND(1)*100):IF Y<30ORY>80 G
OTO 630
640 COL=INT(RND(1)*11):IF COL<4 OR CO
L>11 THEN GOTO 640
650 LINE(40,85)-(X,Y),COL:NEXT
660 PSET(25,25):PRINT#1,"YOUR NUMBER
WAS "CG%:GOSUB 2420
670 FLAG=1:GOTO1030
680 '
690  ' SHIP TO FORT
700  '
710  SOUND6,31:SOUND8,16:SOUND11,103
720  SOUND12,30:SOUND13,8:SOUND7,55
730  FOR F=1 TO400:NEXT F:SOUND8,0
740  FOR X=LTOMSTEP-1:PSET((H+(X*N)),
(V+(P+(X*X)))):FORF=1TO100:NEXT:NEXT
750  FOR F=1TO100:NEXT
760  FOR X=LTOMSTEP-1:PRESET((H+(X*N)
),(V+(P+(X*X)))):NEXT
770  RETURN
780  '
790  ' FORT TO SHIP
800  '
810  SOUND6,31:SOUND8,16:SOUND11,103
820  SOUND12,30:SOUND13,8:SOUND7,55
830  FOR F=1 TO400:NEXT F:SOUND8,0
840  FOR X=LTOM:PSET(V+(N-(X*X)),(H+(
X*P))):FOR F=1TO100:NEXT:NEXT
850  FORF=1TO100:NEXT
860  FOR X=LTOM:PRESET(V+(N-(X*X)),(H
+(X*P))):NEXT
870  LINE(0,155)-(255,178),7,BF
880  TRY%=TRY%+1:PSET(15,170):PRINT#1
,"TRYS = "TRY%
890 RETURN
```

```
900 '
910 'EXPLOSION
920 '
930 SOUND0,0:SOUND1,5
940 SOUND2,0:SOUND3,13
950 SOUND4,255:SOUND5,15
960 SOUND6,30:SOUND7,0
970 SOUND8,16:SOUND9,16
980 SOUND10,16:SOUND11,0
990 SOUND12,5:SOUND13,0
1000 FORX=0TO30:NEXTX
1010 SOUND12,56:SOUND13,0
1020 RETURN
1030 SCREEN1,0,0
1040 SOUND8,0:SOUND9,0:SOUND10,0
1050 IF FLAG=1 GOTO 1080
1060 PRINTTAB(1);"WELL DONE ";NA$
1070 LOCATE0,5:PRINT"You guessed my n
umber in...."TRY%;"goes":GOTO 1100
1080 FLAG=0:LOCATE0,5:PRINT"HOORAY,I
WON. YOUR NUMBER WAS "
1090 LOCATE12,8:PRINTUN%
1100 LOCATE0,10:PRINT"Would you like
another game ?"
1110 CLOSE#1
1120 LOCATE 8,22:PRINT"(Press Y or N)
"
1130 IF INKEY$<>""THEN 1130
1140 K$=INKEY$:IF K$="Y"OR K$="y"THEN
 GOTO 50 ELSE IF K$=""THEN1140
1150 CLS:LOCATE2,10:PRINT"THANKS FOR
THE GAME....."
1160 LOCATE8,15:PRINT"BYE..BYE":END
1170 '
1180 REM:INPUT LEVEL
1190 '
1200 IF INKEY$<>""THEN 1200
1210 CLS:LOCATE 0,6:PRINT"PLEASE TYPE
 IN YOUR NAME...."
1220 LOCATE 0,8:INPUT NA$
1230 LOCATE 0,10:PRINT"WHICH LEVEL DO
 YOU REQUIRE"
1240 LOCATE 0,12:INPUT L:IF L<1OR L>4
 THEN CLS:GOTO 1230
1250 '
1260 REM GET RANDOM NUMBER
1270 '
1280 ON L GOSUB 1350,1370,1390,1410
1290 '
1300 LOCATE0,14:PRINT"What number bet
ween 1 & 1000 do you want the compute
r to  try and guess?"
1310 LOCATE0,18:INPUTUN%:IF UN%<1 OR
UN%>1000 THEN CLS:GOTO 1300
1320 LOCATE 0,20:PRINT"THANK YOU "NA$
1330 GOSUB 2370
1340 RETURN
1350 NBR=INT(10*RND(1)+1)
1360 RETURN
1370 NBR=INT(100*RND(1)+1)
1380 RETURN
1390 NBR=INT(500*RND(1)+1)
1400 RETURN
1410 NBR=INT(1000*RND(1)+1)
1420 RETURN
1430 '
1440 '
1450 REM:GRAPHICS
1460 '
1470 SCREEN2,2,0:COLOR12,7,7:CLS
1480 FOR F=0TO255 STEP 8
1490 LINE(F+4,132)-(F+6,132),4
1500 PSET(F+5,131),4
1510 NEXT F
1520 LINE(0,133)-(255,149),4,BF
1530 LINE(0,95)-(63,95),12
1540 LINE(63,95)-(87,149),12
1550 LINE(87,149)-(0,149),12
1560 PAINT(0,148),12
1570 LINE(23,71)-(55,95),13,BF
1580 FOR F=29 TO 45 STEP 8
1590 LINE(F,71)-(F+4,75),0,BF
1600 NEXT
1610 LINE(56,77)-(61,80),1,BF
1620 CIRCLE(223,20),8,10
1630 PAINT(223,20),10
1640 CIRCLE(208,35),8,15,,,.5
1650 CIRCLE(223,36),15,15,,,.5
1660 CIRCLE(235,38),11,15,,,.4:LINE(2
08,35)-(235,41),7:PAINT(208,35),15,15
1670 CIRCLE(50,7),7,15,,,.5:CIRCLE(59
,9),5,15,,,.5:LINE(50,7)-(59,7),7:PAI
NT(50,7),15,15
1680 RESTORE:B$="":C$="":D$="":E$="":
F$=""
1690 FOR F=1 TO 32:READ A:B$=B$+CHR$(
A):NEXT
1700 FOR F=1 TO 32:READ A:C$=C$+CHR$(
A):NEXT
1710 FOR F=1 TO 32:READ A:D$=D$+CHR$(
A):NEXT
1720 FORF=1TO32:READA:E$=E$+CHR$(A):N
EXT
1730 SPRITE$(3)=B$
1740 SPRITE$(4)=C$
1750 SPRITE$(1)=D$
1760 SPRITE$(2)=E$
1770 PUT SPRITE1,(185,132),4,1
1780 PUT SPRITE2,(201,132),4,2
1790 SOUND7,56
1800 PLAY"xt$;","xt$;","xt$;"
1810 FOR F=230 TO 185 STEP-1
1820 PUT SPRITE3,(F,116),1,3
1830 PUT SPRITE4,(F+16,116),1,4
1840 LINE(15,170)-(255,178),7,BF
1850 NEXT F
1860 RESTORE 2510
1870 FOR Y%=0 TO5:A$="":FOR X%=0TO7
1880 READA%:A$=A$+CHR$(A%):NEXT X%
1890 SPRITE$(Y%+25)=A$:NEXTY%
```

```
1900 RETURN
1910 REM PLANE / BIRD MOVEMENT
1920 PUT SPRITE9,(R%,60),1,29
1930 PUT SPRITE10,(S%,50),1,30
1940 PUT SPRITE27,(G%,4),1,25
1950 PUT SPRITE28,(G%-16,4),4,28
1960 PUT SPRITE29,(G%-32,4),13,27
1970 PUT SPRITE30,(G%-48,4),9,26
1980 G%=G%+3
1990 R%=R%+1:S%=S%-1
2000 FOR F=1 TO 30:NEXT F
2010 PUT SPRITE9,(R%,60),1,30
2020 PUT SPRITE10,(S%,50),1,29
2030 FOR F=1 TO 30:NEXT F
2040 R%=R%+1:S%=S%-1
2050 RETURN
2060 '
2070 REM SET UP ROUTINE
2080 '
2090 KEY OFF:SCREEN 1,0,0:COLOR1,2,2:
CLS:STOP OFF:CG%=1000:L%=1000:Z%=1:X%
=1:TRY%=0:G%=50:R%=255:S%=255
2100 T$="t255cr64cegr64g2o5gr64g2er64
e2o4cr64cegr64g2o5gr64g2fr64f2o4dr64d
far64a2o5ar64a2fr64f2o4dr64dfar64a2o5
ar64a2er64eo4cr64cego5c2o6cr64c2o5gr6
4g2o4cr64cego5c2o6cr64c2ar64a2o4ddfar
64a.r64af#go5e.r64eco4er64e..r64ea2gc
.c."
2110 OPEN"GRP:" FOR OUTPUT AS #1
2120 KEY OFF:LOCATE 8,10,0:PRINT"SINK
 THE SHIP"
2130 LOCATE 0,20,0:PRINT"Do you requi
re instructions ?"
2140 LOCATE 8,22:PRINT"(Press Y or N)
"
2150 IF INKEY$<>""THEN 2150
2160 K$=INKEY$:IF K$="Y"OR K$="y"THEN
 GOSUB 2190 ELSE IF K$=""THEN2160 ELS
E CLS:RETURN
2170 RETURN
2180
2190 REM INSTRUCTION ROUTINE
2200
2210 CLS:PRINTTAB(9);"INSTRUCTIONS"
2220 PRINTTAB(30);"To sink the ship y
ou must   guess the number that the
  computer thinks of before it guesse
s yours."
2230 PRINTTAB(29);"Just to help you t
he computerwill give  you clues to he
lp you guess."
2240 PRINTTAB(29);"Press RETURN after
 each input"
2250 PRINT"You have 4 levels availabl
e:-"
2260 PRINTTAB(1);"1  A number between
 1 & 10   "
2270 PRINTTAB(1);"2  A number between
 1 & 100  "
2280 PRINTTAB(1);"3  A number between
 1 & 500  "
2290 PRINTTAB(1);"4  A number between
 1 & 1000 "
2300 GOSUB 2370
2310 CLS:LOCATE0,6:PRINT"The best sco
re is achieved   by sinking the ship
in the   lowest number of shots or
 before your fort is blown up!"
2320 PRINTTAB(29);"You will be able t
o make the computer guess your intege
r  number which can be between  1 & 1
000 ";
2330 PRINT"and it will use     logic
to workout what the    number is..."
2340 GOSUB 2370
2350 RETURN
2360 '
2370 REM SPACEBAR ROUTINES
2380 '
2390 LOCATE 1,23:PRINT"Press spacebar
 to continue"
2400 A=STRIG(0):IF A=0THEN 2400
2410 RETURN
2420 PSET(15,183):PRINT#1,"PRESS SPAC
EBAR TO CONTINUE"
2430 A=STRIG(0):GOSUB1910:IF A=0 THEN
 2430
2440 LINE(10,183)-(255,191),7,BF
2450 LINE(15,15)-(190,33),7,BF
2460 RETURN
2470 DATA 0,0,0,0,0,0,63,63,7,255,255
,63,31,15,7,3,0,0,0,0,15,9,201,207,20
7,207,255,102,255,255,255,255
2480 DATA30,30,30,30,254,254,254,255,
255,255,255,102,255,255,255,255,0,0,0
,15,15,15,8,8,255,255,255,127,254,252
,252,248
2490 DATA 255,255,255,255,255,255,255
,255,255,255,255,255,255,255,255,255,
255,255,255,255,255,255,255,255,255,2
55,255,255,255,255,255,255
2500 DATA 255,255,255,255,255,255,255
,255,255,255,255,255,255,255,255,255,
255,255,255,255,255,255,255,255,255,2
55,255,255,255,255,255,255
2510 DATA48,24,204,254,255,12,24,48,1
02,102,102,102,219,219,219,219,127,25
5,192,254,127,3,255,254,193,227,119,6
2,28,62,119,99
2520 DATA 0,66,165,153,0,0,0,0,0,0,0,
153,165,66,0,0
```



Designer

Jason Orr of Greenford, Middlesex, takes the etch-a-sketch type of program into the realms of a screen designer using icon symbols to select one of the five drawing modes. You simply move the cursor over the related icon and then press the fire button.

Each mode has its own cursor shape which appears when the cursor moves away from the sprite icon after selection.

When the program starts it asks if you would like to load a screen. Pressing the N key or typing No will take you straight into design mode. Initially the cursor is the one signifying etch-a-sketch mode in which you can use the joystick or arrow keys. Pressing function key 1(F1) enters the pen-up mode and F2 puts the pen down for the drawing mode.

In circle mode the cursor should be moved to the centre of the circle you want to draw. Pressing F3 will mark the centre with a black dot and the cursor can then be moved horizontally to where the circumference will be. Press F4 to draw the circle. If you want an ellipse the aspect ratio can be raised or lowered by pressing F1 or F2.

To draw a line, move the cursor to the start of the line and press F3. Next move the cursor to the end of the line and press F4. A similar process is used to draw a box, but the mapped line describes the diameter of the box.

Paint or fill mode allows you to fill an area with colour ensuring that the line marking the edge of the area is the same colour. Ink colour can be changed by moving the cursor over the colour box and pressing the fire button or space bar.

Normal mode can be returned to at any point simply by pressing the space bar or fire button. Be careful though, in normal mode pressing F3 will clear the screen.

To save a screen to tape the cursor should be moved over the TPE sprite and the fire button or space bar pressed. Gradually your screen information will be saved for future use.

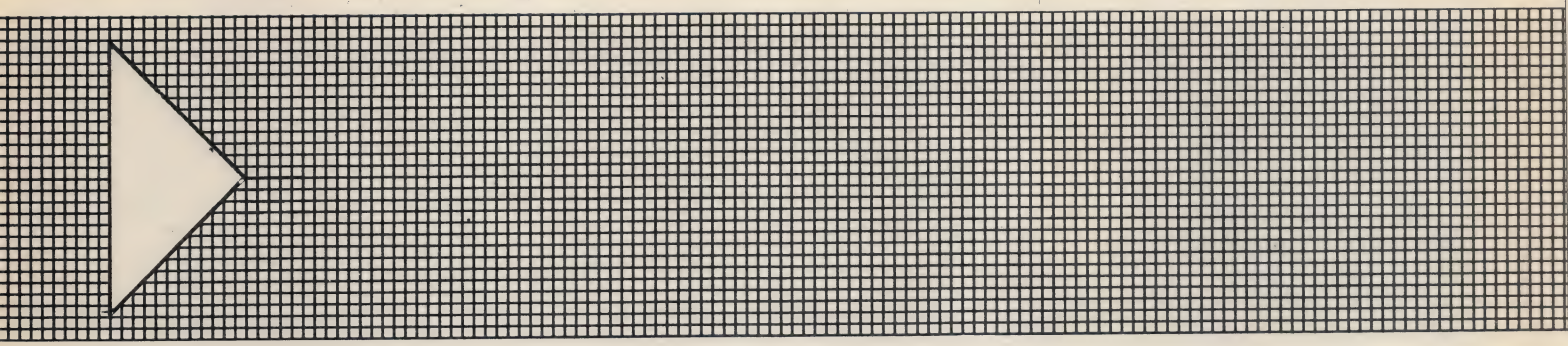
Note that letters in italics should be reversed graphic characters.

Major variables

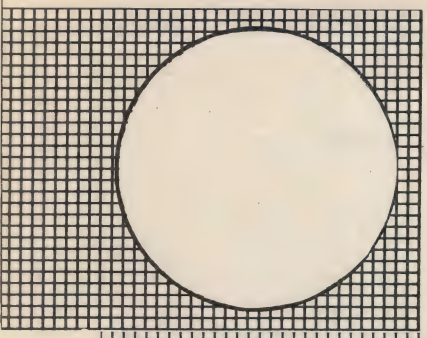
JK	joystick number
XX,YY	cursor co-ordinates
AR	circle aspect ratio
SK	sprite colour
ZX$()	sprite string data
PX	pixel on/off flag
PC	pixel colour
CL	circle colour
MX,MY	co-ordinates for start of line draw
VP,VC	video poke value and colour

Program breakdown

10-110	introductory screens
120-270	graphic screen set-up
280-430	joystick control
440-710	icon design
720-930	set-up cursor sprites
940-950	turn pixel on
960-970	turn pixel off
990-1090	mode selection routines
1100-1140	colour change
1150-1160	select save routine
1170-1190	return to normal mode
1200-1480	draw circle routine
1490-1530	set aspect ratio
1540-1690	line and box routines
1700-1730	fill routine
1740-1840	more line and box routines
1850-1910	restart
1920-1940	tune
1950-2050	save routine
2060-2150	load routine

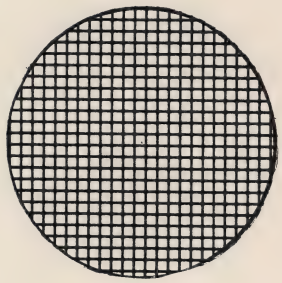


```
10 'MMMMLLLLL   JAY  ART   LLLLLMMMM
20 'MMMMLLLA JJ PRODUTION '85LLLMMMM
30 'MMMMLLWRITTEN ON SONY HB75LLMMMM
40 'MMMMLFOR MSX USER MAGAZINELMMMM
50 CLS:FORP=1 TO 10
60 KEY OFF:PRINT"       JCACYCACRCT";:NEXTP:LOCATE 2,7
70 INPUT"ANY PICTURES TO LOAD IN";LD$
80 IF LD$='NO" OR LD$="N"THEN 110
90 GOSUB2060
100 JOK=1:GOTO130
110 COLOR 15,4,4:SCREEN2,0:COLOR 15,4,4:PC=15:DIM ZX$(5)
120 'JJDRAW GRAPHICS AREAJJ
130 GOSUB440
140 IF JOK=1 THEN 250 ELSE 150
150 'JJSELECT SCN CLR &JOY/KEY OP.JJ
160 OPEN"GRP:" AS #1
170 PSET(10,20):PRINT#1,"JOYSTICK OR KEYS"
180 K$=INKEY$:IF K$="J"THENJK=1:GOTO 210
190 IF K$="K"THEN JK=0:GOTO 220
200 GOTO180
210 PSET(14,30):PRINT#1,"JOYSTICK.":GOTO 230
220 PSET(14,30):PRINT#1,"KEYS."
230 PLAY"O3A32G32A2G8F8F-20E60D8D-2D8R64D4","O5A32G32A2G8F8F-20E60D8D-2D8R64D4"
240 LINE(7,5)-(200,70),4,BF:CLOSE#1:JOK=1
250 XX=128:YY=96:PX=1
260 PUT SPRITE 0,(128,96),PC,0
270 ON KEY GOSUB 940,960,1860
280 KEY(1)ON:KEY(2)ON:KEY(3)ON:DC=3
290 ON STRIG GOSUB 980
300 STRIG(JK) ON
310 DR=STICK(JK):IFDR=0THEN 290
320 ON DR GOTO 330,340,350,360,370,380,390,400
330 YY=YY-1:GOTO 410
340 XX=XX+1:YY=YY-1:GOTO 410
350 XX=XX+1:GOTO 410
360 XX=XX+1:YY=YY+1:GOTO 410
370 YY=YY+1:GOTO 410
380 XX=XX-1:YY=YY+1:GOTO 410
390 XX=XX-1:GOTO 410
400 XX=XX-1:YY=YY-1
410 PUT SPRITE 0,(XX,YY),PC,0
420 IF PX=1 THEN PSET(XX+4,YY+5),CL:GOTO 310
430 GOTO 310
440 'JJJIKON DESIGNJJJ
450 SCREEN 2,0:COLOR 15,4,4
460 AR=1.4
470 CIRCLE(225,174),8,9,,,AR
480 LINE (30,0)-(225,0),5:LINE(30,192)-(225,192),5:LINE(5,30)-(5,162),5:LINE(255
,30)-(255,162),5
490 A$="R3D4L3U4R3C9R2C15R3D2G2U4D2F3"
500 B$="C9U1R2C15U4R3D4U2L3R4C9R2D1C15U3D4U1R3D1U4"
510 C$="R32D30L32U30"
520 D$="R3L3D4R4C9R2C15U5C9R3D1C15R3D2G2U4D2F2"
530 E$="D4R3C9R3C15U5C9R3D1C15D4U4F4U4"
540 F$="R8D6L8U6"
```

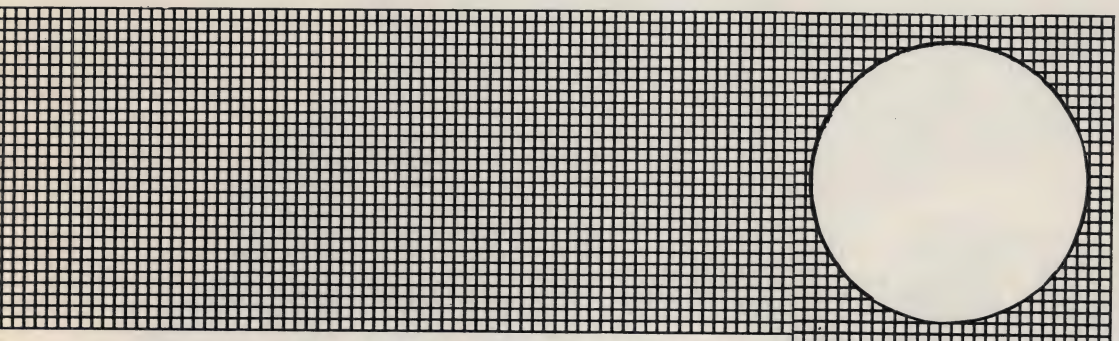


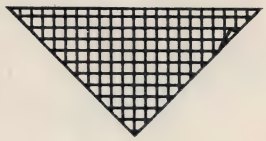
```
550 G$="R3L2D6C9R4U1"
560 H$="R3D3L3U3D6C9R5U1C15U4D5R3L3U3R2L2U3R3"
570 I$="R3L3D4U2R2C9R4U2C15D5C9R3U1C15R3L3U5C9R5D1C15D4R3"
580 CL=15:C1=1
590 FORP=1TO164 STEP 32
600 LINE(P+14,165)-(P+14+30,185),9,BF
610 NEXTP
620 LINE(180,170)-(200,180),15,BF
630 LINE(209,164)-(242,185),7,B
640 DRAW"BM17,170XA$;XB$;"
650 DRAW"BM20,177XD$;"
660 DRAW "BM50,170XA$;XB$;"
670 DRAW "BM53,177XE$;"
680 DRAW"BM83,170XA$;XB$;"
690 DRAW"BM90,177XF$;"
700 DRAW"BM120,170XG$;C4R1U5L1C15XH$;"
710 DRAW"BM150,170XI$;"
720 'JJ NORMAL MODE SPRITE JJ
730 RESTORE:FORP=1TO8:READO
740 ZX$(1)=ZX$(1)+CHR$(O)
750 NEXTP:SPRITE$(0)=ZX$(1)
760 DATA 195,129,0,28,20,28,129,195
770 'JJ CIRCLE MODE SPRITE JJ
780 FORP=1TO8:READZ1
790 ZX$(2)=ZX$(2)+CHR$(Z1)
800 NEXTP:SPRITE$(1)=ZX$(2)
810 DATA 195,195,36,24,24,36,195,195
820 'JJ LINE MODE SPRITE JJ
830 FORP=1TO8:READZ2
840 ZX$(3)=ZX$(3)+CHR$(Z2)
850 NEXTP:SPRITE$(2)=ZX$(3)
860 DATA 8,8,8,8,247,8,8,8
870 'JJ BOX MODE SPRITE JJ
880 FORI=1TO8:READZ3:ZX$(4)=ZX$(4)+CHR$(Z3):NEXTI:SPRITE$(3)=ZX$(4)
890 DATA 255,129,129,157,149,157,129,255
900   JJ PAINT MODE SPRITE JJ
910 FORY=1TO8:READZ4:V$=V$+CHR$(Z4):NEXTY:SPRITE$(4)=V$
920 DATA 255,129,255,3,15,24,24,24
930 RETURN
940 'JJ TURN OFF PIXEL JJ
950 PX=0:YY=YY-1:XX=XX-1:PC=1:RETURN 360
960 'JJ TURN ON PIXEL JJ
970 PX=1:YY=YY-1:XX=XX-1:PC=15:RETURN 360
980 'JJ BRANCH TO DRAW MODES JJ
990 'JJ GOTO CIRCLE ROUTINE JJ
1000 IF(XX>15 AND XX<45)AND(YY>165 AND YY<185) THEN SN=1:GOSUB1920:GOTO  1200:RE
TURN 270
1010 'JJ GOTO LINE ROUTINE JJ
1020 IF(XX>47 AND XX<77)AND(YY>165ANDYY<185) THEN ID=0:SN=2:GOSUB1920:KEY(1)OFF:
KEY(2)OFF:KEY(5)OFF:KEY(3)ON:KEY(4)ON:GOTO 1540:RETURN 270
1030 'JJ GOTO BOX ROUTINE JJ
1040 IF(XX>79 AND XX<109)AND(YY>165 AND YY<185) THEN ID=1:SN=3:GOSUB1920:KEY(1)O
FF:KEY(2)OFF:KEY(5)OFF:KEY(3)ON:KEY(4)ON:GOTO 1540:RETURN 270
1050 'JJ GOTO PAINT ROUTINE JJ
```

```
1060 IF(XX>142ANDXX<172)AND(YY>165AND YY<185) THEN FL=1:SN=4:GOSUB1920:FORK=2TO5
:KEY(K)OFF:NEXTK:KEY(1)ON:GOTO 1540:RETURN270
1070 'JJ GOTO COLOUR ROUTINE JJ
1080 STRIG(JK)ON
1090 IF(XX>175 AND XX<205)AND(YY>165 AND YY<185) THEN 1100 ELSE 1150
1100 'JJ COLOR CHANGE ROUTINE JJ
1110 BEEP:CL=CL+1:IF CL>15 THEN CL=1
1120 LINE(180,170)-(200,180),CL,BF
1130 LINE(205,165)-(205,185),9
1140 ON DC GOTO1200,1550,270
1150 ' JJJ GOTO SAVE TAPE ROUTINE JJJ
1160 IF(XX>111 AND XX<141)AND(YY>165 AND YY<185) THEN GOSUB 1950
1170 'JJ RETURN TO NORMAL MODE JJ
1180 FORK=1TO5:KEY(K)OFF:NEXTK
1190 FORK=1TO5:KEY(K)OFF:NEXTK:FL=0:PRESET(CX,CY):PLAY"O3B32","O4C32","O4E32":PU
T SPRITE 0,(XX,YY),PC,0:RETURN 270
1200 'JJ CIRCLE ROUTINE JJ
1210 DC=1:STRIG(JK)ON:PRESET(CX,CY)
1220 ON KEY GOSUB 1440,1490,1370,1380
1230 KEY(1)ON:KEY(2)ON:KEY(3)ON:KEY(4)ON
1240 DR=STICK(JK):IFDR=0THEN 1240ELSE1250
1250 ON DR GOTO 1260,1270,1280,1290,1300,1310,1320,1330
1260 YY=YY-1:GOTO 1340
1270 XX=XX+1:YY=YY-1:GOTO 1340
1280 XX=XX+1:GOTO 1340
1290 XX=XX+1:YY=YY+1:GOTO 1340
1300 YY=YY+1:GOTO 1340
1310 XX=XX-1:YY=YY+1:GOTO 1340
1320 XX=XX-1:GOTO 1340
1330 XX=XX-1:YY=YY-1
1340 IF POINT(XX+4,YY+5)=1 THEN SK=15 ELSE SK=1
1350 PUT SPRITE 0,(XX,YY),SK,1
1360 GOTO 1240
1370 PRESET(CX,CY):CX=XX+4:CY=YY+5:PSET(CX,CY),1:RETURN 1240
1380 'JJ DRAW CIRCLE JJ
1400 CIRCLE(CX,CY),ABS(XX+4-CX),CL,,,AR
1410 RETURN 1240
1440 'JJ LOWER ASPECT RATIO JJ
1450 AR=AR-.1:IF AR<.1 THEN AR=1.4 ELSE 1460
1460 LINE(210,166)-(241,182),4,BF
1470 CIRCLE(225,174),8,9,,,AR
1480 RETURN 1240
1490 'JJ RAISE ASPECT RATIO JJ
1500 AR=AR+.1:IF AR>6 THEN AR=1.4 ELSE1510
1510 LINE(210,166)-(241,182),4,BF
1520 CIRCLE(225,174),8,9,,,AR
1530 RETURN 1240
1540 ' JJ LINE & BOX ROUTINE JJ
1550 DC=2:STRIG(0)ON:PRESET(CX,CY)
1560 ON KEY GOSUB 1700,,1740,1770
1570 DR=STICK(JK):IFDR=0 THEN 1570
1580 ONDR GOTO 1590,1600,1610,1620,1630,1640,1650,1660
1590 YY=YY-1:GOTO 1670
1600 XX=XX+1:YY=YY-1:GOTO 1670
1610 XX=XX+1:GOTO 1670
```

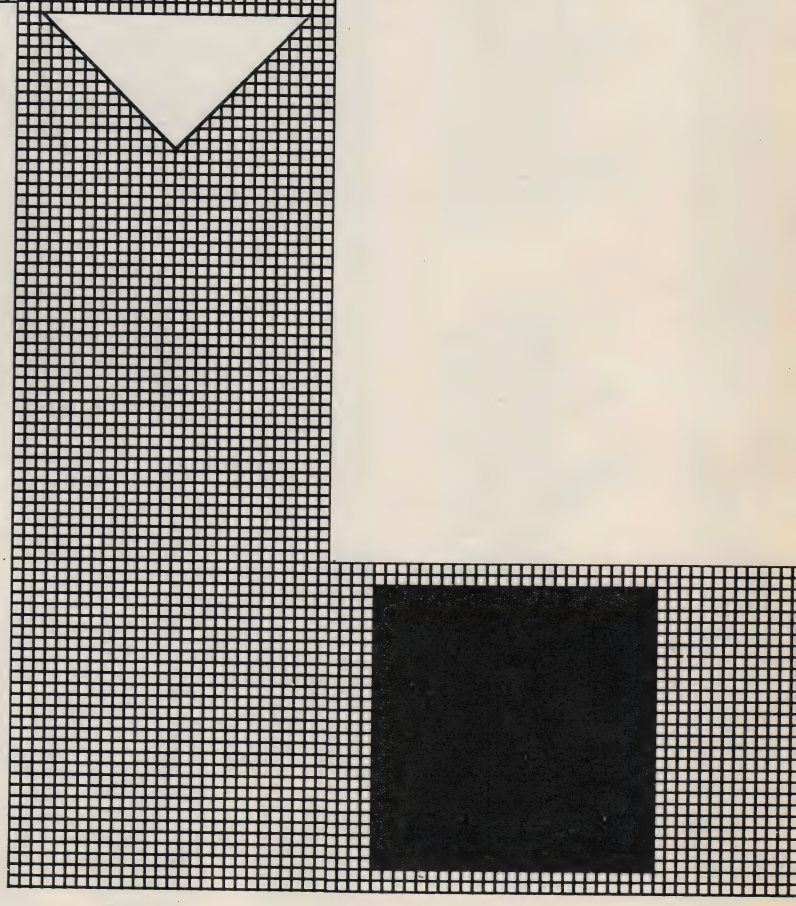


```
1620 XX=XX+1:YY=YY+1:GOTO 1670
1630 YY=YY+1:GOTO 1670
1640 XX=XX-1:YY=YY+1:GOTO 1670
1650 XX=XX-1:GOTO 1670
1660 XX=XX-1:YY=YY-1
1670 IF POINT(XX+4,YY+5)=1 THEN SK=15 ELSE SK=1
1680 PUT SPRITE 0,(XX,YY),SK,SN
1690 GOTO 1570
1700 'JJPAINT SHAPEJJ:PRESET(CX,CY)
1710 IFFL<>1 THEN RETURN1580ELSE1720
1720 PAINT(XX+4,YY+5),CL,CL
1730 RETURN 1580
1740 ' JJ FIRST CO-ORDINATE JJ
1750 PRESET(MX,MY):MX=XX+4:MY=YY+5:PSET(MX,MY),1
1760 RETURN 1570
1770 'JJ DRAW LINE OR BOX JJ
1780 IF ID=1 THEN 1820 ELSE 1790
1790 'JJ LINE JJ
1800 PRESET(MX,MY):LINE(MX,MY)-(XX+4,YY+5),CL:XX=XX:YY=YY:JT=0
1810 RETURN 1680
1820 'JJ BOX JJ
1830 PRESET(MX,MY):LX=XX+4:LY=XX+5:LINE(MX,MY)-(XX+4,YY+5),CL,B:XX=XX:YY=YY:JT=0
1840 RETURN 1680
```






```
1850 'JJ COLOR CHANGE ROUTINE JJ
1860 'JJ RE-START PROGRAM JJ
1870 CLS:RESTORE
1880 FORM=0TO5
1890 SPRITE$(M)=" "
1900 NEXTM
1910 ERASE ZX$:GOTO 110
1920 'JJ MODE TUNE JJ
1930 PLAY"V5T12006C18D18C18D18C7A7F7"
1940 RETURN
1950 'JJ SAVE PICTURE JJ
1960 'IF ONLY I KNEW MACHINE CODE.
1970 LINE(5,0)-(255,192),4,B
1980 BEEP
1990 OPEN"CAS:ART" FOR OUTPUT AS#1
2000 FORP=0 TO 4704 STEP 256
2010 FORC=P TO P+256
2020 PRINT#1,VPEEK(C);",";VPEEK(8192+C)
2030 NEXTC,P
2040 CLOSE#1
2050 RETURN
2060 'JJ LOAD ART FROM TAPE JJ
2070 COLOR 15,4,4:SCREEN2
2080 OPEN"CAS:ART"FOR INPUT AS #1
2090 FORP=0 TO 4704 STEP 256
2100 FORC=P TO P+256
2110 INPUT #1,VP,VC
2120 VPOKEC,VP:VPOKE 8192+C,VC
2130 NEXTC,P
2140 CLOSE#1
2150 RETURN:'THE END!!
```



MSX

Zombie Island

Volcano craters and lethal zombies lie in wait for the unsuspecting visitor to Zombie Island. Just one touch from a zombie brings instant death, even to other zombies.

The program, written by J Bridge of Clackmannanshire, allows you to select up to ten zombies or volcanoes at the beginning of each game. These are then placed at random around the island and you must avoid the clutches of the undead by causing them to collide with each other or fall into a volcano. If four or more zombies appear in a row then some will become invisible.

Major variables

N	number of zombies
V	number of volcanoes
X,Y	x,y co-ordinates for grid
X%,Y%	your position
X( ),Y( )	zombie's position
K( ),J( )	volcano position
A	number of zombies killed by each other
B	number of zombies killed in volcanoes

Program breakdown

60-130	select number of zombies and volcanoes
170-250	draw island
350-490	position sprites
500-880	detect your move
890-1170	move zombies and check for collisions
1180-1220	kill zombies, check for win or lose
1240-1740	define sprites
1750-1900	lose routine
1900-1990	win routine
2090-2250	instructions

```
10 KEY OFF
20 GOSUB 2070
30 SCREEN 0
40 COLOR 1,11,11
50 CLS
60 REM ****************************
70 REM INPUT ZOMBIES AND VOLCANOES
80 REM ****************************
90 INPUT"ENTER NUMBER OF ZOMBIES(1-10
)";N
100 PRINT:PRINT
110 IF N<1 OR N>10 THEN 90
120 INPUT "ENTER NUMBER OF VOLCANOES(
1-10)";V
130 IF V<1 OR V>10 THEN 120
140 SCREEN 2,2
150 COLOR 6,11,11
160 CLS
170 REM ************
180 REM DRAW ISLAND
190 REM ************
200 FOR X=30 TO 230 STEP 20
210 LINE(X,200)-(X,0)
220 NEXT X
230 FOR Y=0 TO 180 STEP 20
240 LINE(30,Y*1.4)-(230,Y*1.4)
250 NEXT Y
260 T=RND(-TIME)
270 FOR I=1 TO V
280 K(I)=INT(RND(1)*10)*20+33
290 J(I)=INT(RND(1)*7)*28+3
300 IF POINT (K(I),J(I))=6 THEN 280
310 PAINT (K(I),J(I)),6,6
320 NEXT
330 GOSUB 1270
340 R=RND(-TIME)
350 REM ****************
360 REM POSITION SPRITES
370 REM ****************
380 X%=INT(RND(1)*10)*20+33
390 Y%=INT(RND(1)*7)*28+3
400 IF POINT (X%,Y%)=6 THEN 380
410 PSET (X%,Y%),6
420 PUT SPRITE 0,(X%,Y%),6
430 FOR I=1 TO N
440 X(I)=INT(RND(1)*10)*20+33
450 Y(I)=INT(RND(1)*7)*28+3
460 IF POINT (X(I),Y(I))=6 THEN 440
462 IF POINT(X(I)+20,Y(I))=6 THEN 440
464 IF POINT(X(I)-20,Y(I))=6 THEN 440
466 IF POINT(X(I),Y(I)+28)=6 THEN 440
468 IF POINT(X(I),Y(I)-28)=6 THEN 440
470 PSET (X(I),Y(I)),6
480 PUT SPRITE I,(X(I),Y(I)),1,4
490 NEXT
500 REM ***************
510 REM DETECT MOVEMENT
520 REM ***************
530 D=STICK(0)
540 FOR T=1 TO 150:NEXT
```

```
550 IF D=0 THEN 530
560 ON D GOTO 570,600,650,680,730,760
,810,840
570 Y%=Y%-28
580 IF Y%<3 THEN Y%=3:GOTO 530
590 GOTO 890
600 X%=X%+20
610 IF X%>213 THEN X%=213:GOTO 530
620 Y%=Y%-28
630 IF Y%<3 THEN Y%=3:X%=X%-20:GOTO 5
30
640 GOTO 890
650 X%=X%+20
660 IF X%>213 THEN X%=213:GOTO 530
670 GOTO 890
680 X%=X%+20
690 IF X%>213 THEN X%=213:GOTO 530
700 Y%=Y%+28
710 IF Y%>171 THEN Y%=171:X%=X%-20:GO
TO 530
720 GOTO 890
730 Y%=Y%+28
740 IF Y%>171 THEN Y%=171:GOTO 530
750 GOTO 890
760 X%=X%-20
770 IF X%<33 THEN X%=33:GOTO 530
780 Y%=Y%+28
790 IFY%>171 THEN Y%=171:X%=X%+20:GOT
O 530
800 GOTO 890
810 X%=X%-20
820 IF X%<33 THEN X%=33:GOTO 530
830 GOTO 890
840 X%=X%-20
850 IF X%<33 THEN X%=33:GOTO 530
860 Y%=Y%-28
870 IF Y%<3 THEN Y%=3:X%=X%+20:GOTO 5
30
880 GOTO 890
890 IF POINT (X%+5,Y%+5)=6 THEN 1780
900 ON SPRITE GOSUB 1230
910 SPRITE ON
920 PUT SPRITE 0,(X%,Y%),6
930 FOR T=1 TO 500:NEXT
940 FOR I=1 TO N
950 ON SPRITE GOSUB 1180
960 SPRITE ON
970 IF Y(I)=209 AND X(I)=240  THEN 11
60
980 C=1
990 FOR S=1 TO 3
1000 PUT SPRITE I,(X(I),Y(I)),15
1010 FOR H=1 TO 100:NEXT
1020 PUT SPRITE I,(X(I),Y(I)),C
1030 FOR H=1 TO 100:NEXT
1040 NEXT
1050 IF X(I)<X% THEN X(I)=X(I)+20
1060 IF X(I)>X% THEN X(I)=X(I)-20
1070 IF Y(I)<Y% THEN Y(I)=Y(I)+28
1080 IF Y(I)>Y% THEN Y(I)=Y(I)-28
1090 REM ******************
1100 REM DETECT volcano
1110 REM ******************
1120 IF POINT (X(I)+5,Y(I)+5)=6 THEN
X(I)=240:Y(I)=209:C=0:B=B+1
1130 IF A+B=N THEN PLAY"GEDEG" :GOTO
1940
1140 PUT SPRITE I,(X(I),Y(I)),C,4
1145 IF X(I)< 240 THEN BEEP:BEEP:BEEP
1147 IF X(I)=240 THEN PLAY"L24GADEA"
1150 FOR T=1 TO 500:NEXT
1160 NEXT I
1170 GOTO 530
1180 SPRITE OFF
1190 IF X(I)=X% AND Y(I)=Y% THEN PLAY
"L16GABDEA":GOTO 1780
1195 X(I)=240:Y(I)=209
1200 PUT SPRITE I,(240,209),0:A=A+1
1210 IF A+B=N THEN PLAY"GEDEG" :GOTO
1940
1220 RETURN
1230 GOTO 1780
1240 REM ***************
1250 REM DEFINE SPRITES
1260 REM ***************
1270 FOR I=1 TO 16
1280 READ A$
1290 B$=B$+CHR$(VAL("&B"+LEFT$(A$,8))
)
```

```
1300 C$=C$+CHR$(VAL("&B"+RIGHT$(A$,8)
))
1310 NEXT I
1320 SPRITE$(0)=B$+C$
1330
1340 FOR I=1 TO 16
1350 READ A$
1360 D$=D$+CHR$(VAL("&B"+LEFT$(A$,8))
)
1370 E$=E$+CHR$(VAL("&B"+RIGHT$(A$,8)
))
1380 NEXT I
1390 SPRITE$(4)=D$+E$
1400 RETURN
1410 DATA 0000001111000000
1420 DATA 0000011111100000
1430 DATA 0000110110110000
1440 DATA 0000111111110000
1450 DATA 0000111001110000
1460 DATA 0000011111110000
1470 DATA 0000001111000000
1480 DATA 1111111111111111
1490 DATA 0011111111111100
1500 DATA 0000111111110000
1510 DATA 0000111111110000
1520 DATA 0000111111110000
1530 DATA 0000111001110000
1540 DATA 0001100000011000
1550 DATA 0011000000001100
1560 DATA 0111000000001110
1570
1580 DATA 0000100000010000
1590 DATA 0000010000100000
1600 DATA 0000001111000000
1610 DATA 0000111111110000
1620 DATA 0001110110111000
1630 DATA 0011111111111100
1640 DATA 1001111111111000
1650 DATA 1000011111100000
1660 DATA 1000001111000000
1670 DATA 1111111111111111
1680 DATA 0000111111110001
1690 DATA 0000111111110001
1700 DATA 0000011001100001
1710 DATA 0000010000100000
1720 DATA 0000100000010000
1730 DATA 0001110000111000
1740 RETURN
1750 REM ************
1760 REM KILL ROUTINE
1770 REM ************
1780 SCREEN 3
1790 CLS
1800 OPEN "GRP:" AS #1
1810 COLOR 15,6,6
1820 DRAW "BM20,30"
1830 CLS
1840 PRINT #1,"YOU WERE"
1850 DRAW "BM50,100"
1860 PRINT #1,"KILLED"
1870 PLAY"L12CDEFABC"
1880 INTERVAL ON
1890 ON INTERVAL= 200 GOSUB 2010
1900 GOTO 1900
1910 REM ***********
1920 REM WIN ROUTINE
1930 REM ***********
1940 SCREEN 1
1950 COLOR 4,14,5
1960 LOCATE 8,5
1970 PRINT "YOU SURVIVED!"
1980 PRINT"  YOU KILLED ";N;" ZOMBIES
 AND":PRINT"YOU HAD ";V;"VOLCANOES."
1990 IF N<5 AND V>5 THEN LOCATE 3,12:
PRINT"TRY MORE ZOMBIES OR LESS":PRINT
"VOLCANOES."
2000 GOSUB 2280
2010 CLS
2020 SCREEN 1
2030 COLOR 1,3,12
2040 LOCATE 3,5,0:PRINT"YOU KILLED ";
A+B;" ZOMBIES."
2050 IF N>6 AND V<3 THEN LOCATE 3,10:
PRINT"TRY LESS ZOMBIES OR MORE":PRINT
" VOLCANOES."
2060 GOSUB 2280
2070 COLOR 15,4,4
2080 CLS
2090 REM ************
2100 REM INSTRUCTIONS
2110 REM ************
2120 LOCATE 3,2:PRINT"You are on Zomb
ie island,which is"
2130 PRINT"inhabited by you and unfri
endly"
2140 PRINT"Zombies.":PRINT"   There a
re also volcanoes on the"
2150 PRINT"island."
2160 PRINT:PRINT"   Move yourself aro
und the island"
2170 PRINT"one square at a time,using
 the cursorkeys to avoid the Zombies
and":PRINT"volcanoes."
2180 PRINT:PRINT"Press two keys toget
her for diagonal movements."
2190 PRINT"   The Zombies will move t
owards you"
2200 PRINT"and if they collide or fal
l into a"
2210 PRINT"volcano will die."
2220 PRINT:PRINT"   KILL THE ZOMBIES
BEFORE THEY KILL"
2230 PRINT"YOU!!!"
2240 PRINT:PRINT"Press the space bar.
"
2250 A$=INKEY$
2260 IF A$<>" " THEN 2250
2270 RETURN
2280 LOCATE 3,18:PRINT"DO YOU WANT AN
OTHER GAME.":PRINT"   (Y OR N)?"
2290 A$=INKEY$
2300 IF A$="Y" OR A$="y" THEN RUN 30
2310 IF A$="n" OR A$="N" THEN LOCATE
5,15:PRINT"END OF GAME."
2320 GOTO 2280
```

MSX

Competition Results

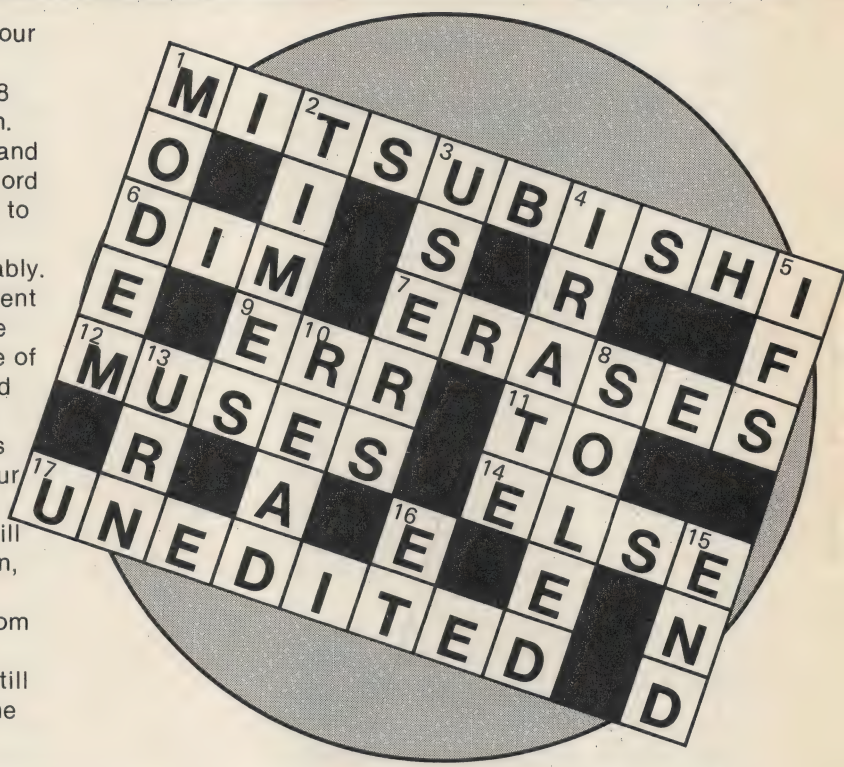
Thank you for all your entries to the Mitsubishi ML-F48 Crossword Competition. Despite the odd query and the occasional cross word about the missing clue to 10 down, most people seemed to cope admirably.

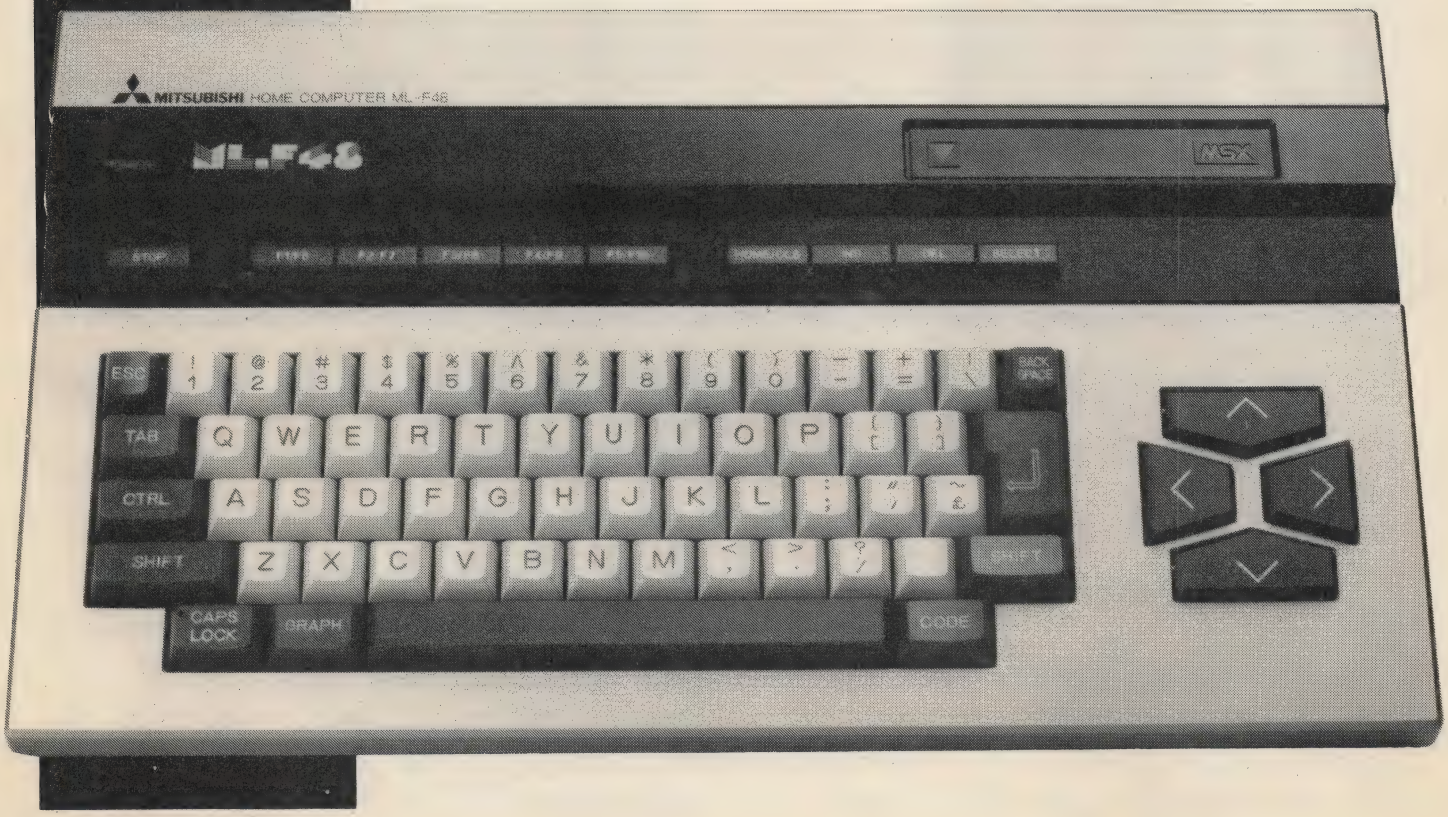
All correct entries went in the lucky dip and the winner was Alan Riddle of North Shields, Tyne and Wear. The Mitsubishi computer is winging its way northwards with our congratulations.

In case anyone is still struggling with 10 down, the clue was:

How to get DATA from MSX User

For those who are still totally foxed, here is the full solution.





Safe Keeping

Karl Dallas explains the ins and outs of putting random access files on disk

Cassettes are notoriously slow and unreliable, and furthermore they cannot be used for random acess. So if you want to change something in the middle of a long data file on tape, you have to read it all into the computer. Having done so, you can then make your changes, and write it back again.

That's all very well, but apart from being a very fiddley process, it also means that the length of your data file is limited by the memory size of your computer: about 30k or so, dependent upon the exact length of the data-handling program you're using. For longer data files you will need to use a disk drive, but while long tape files takeages to read and then write back to, disk files can be accessed comparatively quickly and the only limit to file length is the capacity of the disk (360k).

Disk drives are never cheap, and MSX disk drives especially so. You are not exactly spoilt for choice, either. The Sony 3½" drive has been around almost as long as the first MSX computers, and Sanyo's new 5¼" drive should be in the shops by now. Despite the differences in size, the disk formats are identical (though 5¼" disks are cheaper than 3½"), and everything that follows applies to both disks.

Some of you may remember our look at cassette files in the March issue. We came across the SAVE and LOAD commands for ASCII program files on tape: these commands apply to disk programs, too. In fact, on their own they will also be applied to the disk unless you also add the "CAS:" prefix to your command.
So

SAVE "PROGRAM"

will SAVE to disk, while

SAVE "CAS:PROGRAM"

is needed to SAVE to tape if a disk drive is attached.

We also saw that it also possible to SAVE or LOAD programs in compressed format, sometimes described in the manuals as intermediate language format, using CSAVE.

But with disks, SAVE uses the compressed format, unless you append A at the end of the command, thus:

SAVE "PROGRAM",A

will save a program in ASCII format on to disk.

You can MERGE programs SAVEd in ASCII, but not compressed programs, so it is also a good idea to add a three-letter file-descriptor after the program name to remind you what its format was, thus:

SAVE"PROGRAM.ASC",A

There are conventions about these file-descriptors, so it is good to use them and to adhere to the conventions. To indicate a file SAVEd in compressed Basic, add ".BAS", a data file ends ".DAT", word-processed documents are concluded ".DOC", and so on.

Back in March, we saw that you use the OPEN command to get into a data file to read something in it (INPUT) or to write

something into it (OUTPUT), after which you must CLOSE the file. You can have up to 15 files OPEN at a time, unless you have set a lower limit on the possible number with the NEWFILES command, which conserves memory. It is possible to have one file OPEN for reading (INPUT) and at the same time for writing the data (OUTPUT) you have read from it into a second file, though obviously this wouldn't be practicable with long files on tape, since the cassette play head can only be positioned at one place at a time.

The disk head, however, can be skipped over the surface of the disk like the pickup of a record player, which makes it possible to jump between tracks, reading from one and writing to the other more or less simultaneously — rather like a 'scratch' DJ on the New York hip-hop scene.

Which brings us to the implicit superiority of disks.

Again, as we've seen, as well as LOAD and SAVE, the OPEN, CLOSE, OUTPUT and INPUT statements will all work, but unless you use the "CAS:" prefix, they will be directed automatically to disk.

So

```
OPEN "CAS:FILE
NAME" FOR OUTPUT AS 1
```

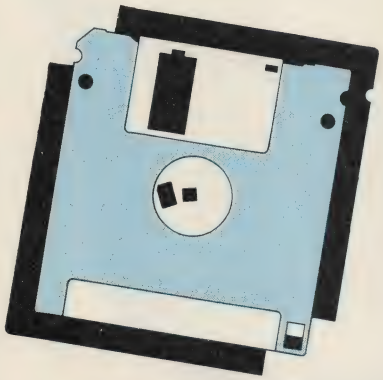
will allow you to write something to a tape file, and

```
OPEN "FILENAME"
FOR OUTPUT AS 1
```

will do the same thing for a disk file.

However, since you may get rich one day and end up owning more than one disk drive, it is good practice also to include an indication of which disk to find the file on. You are allowed to attach up to four disk drives, letters A: B:, C:, and D: (the colons are important), so with just one disk attached, you'll need to insert A: thus:

```
OPEN "A:FILENAME"
FOR OUTPUT AS 1
```



Let's look at sequential files in a bit more detail before we get on to random access. First, we'll OPEN a simple file called DATAWRITE.DAT and write into it your name:

```
10  OPEN "A:DATA
    WRITE. DAT" FOR
    OUTPUT AS 1:REM
    filename no more
    than 8 characters
    plus descriptor
20  INPUT "FIRST
    NAME"; CN$: REM
    can anyone guess
    why we can't use
    FN$ here?
30  INPUT "SURNAME";
    SN$
40  NM$ = CN$ + "
    " + SN$
50  PRINT#1,NM$
60  CLOSE 1
```

If you type this in (don't forget RETURN after each program line) and RUN it, the computer will prompt you for your first and last names, the disk drive will whirr briefly, and that's all. However, if you do a FILES to check the disk directory, you will find that the short DATAWRITE.DAT file is there.

You will need another program to read it, however, so type this in:

```
70  OPEN "A:DATA
    WRITE.DAT" FOR
    INPUT AS 1
80  INPUT#1,NM$
90  PRINT NM$
100 CLOSE 1
```

Now type RUN 70 and it will display back your data to the screen.

Suppose you wanted to add another name? Then you would need the APPEND mode, rather than OUTPUT or INPUT, and whatever you wanted could be added (or APPENDed) to the end. Add the following routine:

```
110 STOP: REM to
    separate new routine
    from earlier routines
120 OPEN "A:DATA
    WRITE.DAT" FOR
    APPEND AS 1
130 INPUT "FIRST
    NAME";CN$
140 INPUT "SUR
    NAME";SN$
150 NM$ = CN$ + "
    " + SN$
160 PRINT #1,MN$
170 CLOSE 1
```

Since we have more than one name in our file now, we will have to introduce a loop to read more than one and display it to the screen. We can do it with a simple addition:

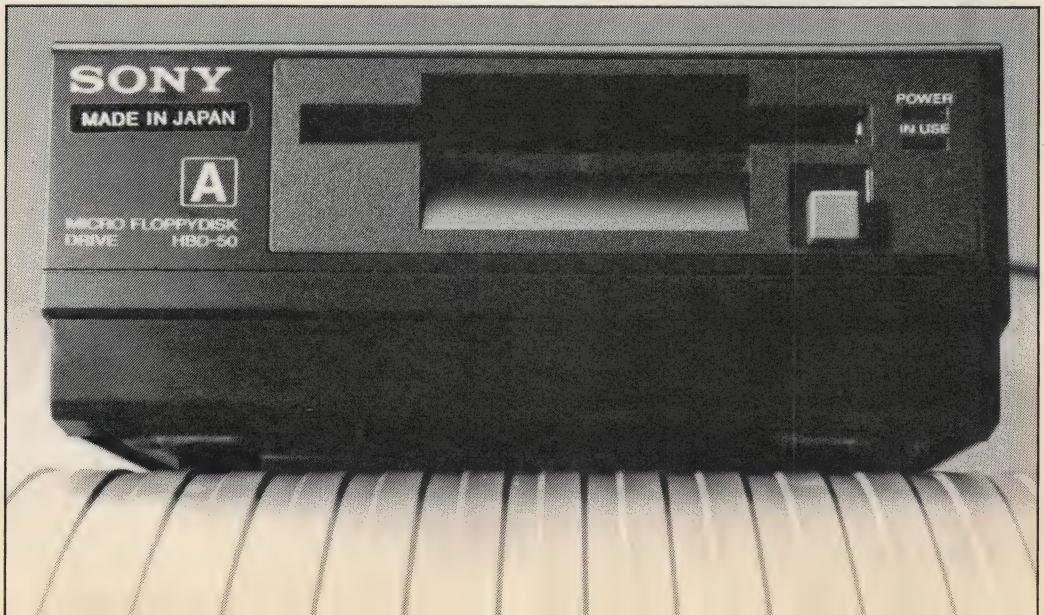
```
95 GOTO 80
```

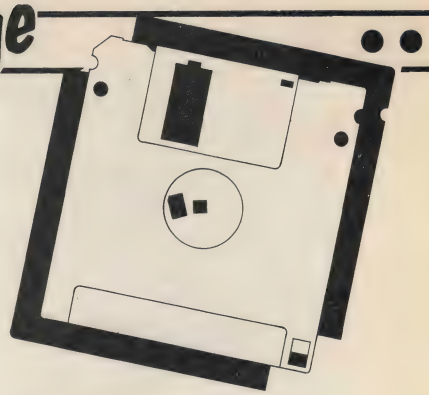
If you make this addition and RUN 70 it, however, you will get an INPUT PAST END IN 80 error when it tries to read past the end of the data in the file, which is not good. There are two solutions.

The first solution answers a question you haven't even asked yet: what do you do, if you are writing in a whole list of names, to tell the computer that you have finished? You can do this by getting the user to type in a name no one would have, like "XXX", and then testing to see if that is what is typed. Change line 130 so that it reads:

```
130 INPUT "FIRST NAME
    (XXX to end)";CN$:IF
    CN$ = "XXX" THEN
    NM$ = CN$:GOTO
    160
```

Plus an instruction to





the program to loop back *unless* it finds you've typed "XXX":

```
165  IF NM$<>"XXX"
     THEN 130
```

Now you need to test for this in your data read by changing line 95:

```
95   IF NM$<>"XXX"
     THEN 80
```

Try it; you will find it works fine. But MSX Basic has a handy EOF (End Of File) statement specifically devised for this problem. Retype line 95 thus:

```
95   IF EOF (1) = 0 THEN
     80
```

EOF gives a −1 (minus one) value if you have come to the end of the file, or 0 (zero) if you haven't.

What you have written here is a *sequential* file, and it works with cassettes or disks. You can see how you have the bare bones here of quite a useful telephone directory program. You can make it longer with the APPEND mode, but if you wanted to change something in the middle, you would have to read it all back into the computer before you could change it, and you would need to know all about nasty things like arrays to do it.

And it is rather slow and laborious, even on disk. However, since disk makes random access really easy, it is a pity not to take advantage of it.

When you OPEN a random access file, you can actually write and read to it at the same time, so you don't need to specify INPUT or OUTPUT. But, obviously, if you are going to change chunks in the middle, the file would get in an awful mess if you took out a short name like Fred Smith and substituted something much longer, like Alastair Nebuchadnezzar, so you have to establish a standard length for each of your records.

The longest a record can be is 255 characters, and if you don't specify anything different, the computer will assume you want that length, but that would be rather wasteful of disk space.

You can specify a shorter length by tagging the record size at the end, thus:

```
OPEN "A:READRITE.DAT"
AS 1LEN = 26
```

Athough we have included just one piece of data in each record so far (first and last names), we could obviously add others, each of which is known as a FIELD: say telephone number, or address. Just as we could specify the length of each record, we also need to specify the space allocated to each field in that record: for instance, we could allocate 18 characters to the name field, and eight to the telephone number, making up the 26-character length of the record.

This is done, surprise surprise, with the FIELD statement.

Here is a little routine to show how it works:

```
200  OPEN "A:READ
     RITE.DAT" AS 1
     LEN = 26
210  FIELD#1,18 AS
     NM$,8 AS TN$
220  R = R + 1
230  INPUT "NAME";NA$:
     IF LEN (NM$) >18
     THEN 230
240  IF NA$ = "XXX"
     THEN 290
250  INPUT "TELEPHONE
     NO:"; TA$:IF LEN
     (TA$) >8 THEN 250
260  LSET NM$ = NA$:
     LSET TN$ = TA$
270  PUT#1, R
280  GOTO 220
290  CLOSE 1
```

There are a few statements you may not have come across before. R is the number of each record: line 220 sets its value at 1 and increases it by 1 each time the program loops back from line 280.

To write something into a random access file you use PUT# instead of PRINT#; we will be meeting its companion, GET#, in a moment. But before we can PUT a record into a file we have to write it into the computer buffer with the LSET command.

Remember that we saw that you could have up to 15 files open at one time, and you could limit their number with the MAXFILES command? And that an unspecified record length would be set automatically to 255 characters long, unless you limited it with the LEN = statement in the file OPENing command?

If you use neither MAXFILES or LEN to tell it different, then the computer assumes you will want to put 15 records at a time, each 255-characters long, into the computer buffer and reserves the appropriate amount of memory for them. That is $15 \times 255 = 3825$ bytes, or nearly 4k of memory gone. In fact, we only needed one buffer of 26 characters, a mere 1/40th or so of a kilobyte, leaving you plenty of program memory.

If you RUN the program and INPUT R number of records then these will be in the file READRITE.DAT. To read them back you will have to use the GET statement, plus the record you want to see, so if you put in Fred Bloggs first, then Joe Cloggs and finally Jack Moggs, to see Joe Cloggs' number you will need to ask for record 2. Here is the routine:

```
300  OPEN "A:READ
     RITE.DAT" AS 1
     LEN = 26
310  FIELD#1,18 AS
     NM$,8 AS TN$
320  INPUT "WHAT
     RECORD DO YOU
     WANT?";R:IF R = 0
     THEN 360
330  GET#1,R
340  PRINT NM$;"  ";TN$
350  GOTO 320
360  CLOSE 1
```

You may have spotted that one problem with disk filing is that unless you know which record is which number, you will not be able to find it. You could keep a note on a piece of paper, but that would be pretty silly, having a collection of equipment worth £500-plus depending for its efficiency on a scrap of paper which you might lose.

What you do is to index your random access file by a second, sequential file, which can be much shorter. So your random access file could contain Joe Bloggs' name, address and telephone number as well as his birthday and names of all his family or his type of business. But all you need in your sequential index is something that tells you Bloggs is record N.

Space limitations don't allow me to spell it all out, but it is actually quite easy. Since the sequential file would be short enough to hold in memory it could be quite fast, too. But I hope I've given you enough pointers on how to proceed from here.

The best next step is to start experimenting.

MSX

First Aid

Graphics loom large among readers problems this month. Eric Doyle has the answers

My first letter this month comes from 71-year-old Mr. J. Crane in Liverpool. Mr.Crane is busily converting programs written for other computers but he is having a few problems with Sinclair BASIC.

I've managed to cope with most of the keywords but any programs with the following words I skipped: ATTR, PAUSE, PRINT OVER, INVERSE, FLASH, BRIGHT. I also avoid lines with user defined graphics in quotes and BEEP commands followed by numbers and variables.

Probably the most difficult task to perform on a conversion is to translate graphics from one machine to another. Since hi-res graphics are easier on MSX than on most other computers, user-defined graphics generally means sprites. It always helps if you can see what the screen should look like on the original computer and use your eyes to do most of the hard work. There comes a time though when an understanding of the terms used is necessary to write the screen movement routines.

Firstly, the BRIGHT and ATTR commands have no equivalent in MSX BASIC. Since BRIGHT only gives a lighter colour, therefore extending the range of colours from eight to fifteen, suitable colours could be substituted from the range available on the MSX.

ATTR is always followed by a set of screen co-ordinates in much the same way as LOCATE. On the Spectrum this returns a number which describes the foreground and background colours of the chosen location as well as whether the colour is BRIGHT or FLASHING. For the technically minded, bit seven indicates a flashing letter and bit six denotes bright or normal, while bits three, four and five give the number corresponding to the background colour and the remaining bits signify the foreground colour.

FLASH can be simulated on your computer using the following routine sent in by reader Andrew Jewel of Plymouth.

```
60000 REM set up ch
aracters
60010 FOR A=256 TO
264: VPOKE BASE(7)+
504+A,0:NEXTA
60020 FOR A=520 TO
727: VPOKE BASE(7)+
504+A,VPEEK(BASE(7)
+A):NEXTA:RETURN
60030 REM flash
60040 FORA=0TO3:VPO
KE BASE(6)+16+A,C1:
NEXTA:SWAPC1,C2:RET
URN
60050 REM convert c
haracters to flashe
rs
60060 FORA=1 TO LEN
(F$):MID$(F$,A,1)=C
HR$(ASC(MID$(F$,A,1
))+63):NEXTA:RETURN
```

Andrew also shows how this can be utilised in a program which can be modified to give the colours that you want by changing the COLOR statement in line 20, and the last digit of the Hex values of C1 and C2 in lines 60 and 70. Remember,for colours with a number greater than nine, use the first five letters of the alphabet, i.e. A for 10 and F for 15 as shown in line 70.

```
10 REM Flash demo
20 SCREEN1:COLOR1,4
,4:KEYOFF
30 F$="MSX USER"
40 GOSUB60000:GOSUB
60050
50 LOCATE10,5:PRINT
F$
60 C1=&H41:REM blue
 on black
70 C2=&H4F:REM blue
 on white
80 ON INTERVAL = 15
 GOSUB 60030
90 INTERVAL ON
100 GOTO100
```

Thank you for that little aid, which also answers one part of the substitute for the PAUSE command using ONINTERVAL.. GOSUB. Simply substitute the value following PAUSE in the original program for the value 150 in line 80.

Sometimes a FOR...NEXT loop is all that is required, bearing in mind that the number following PAUSE should be divided by 50 to convert the length of the delay into seconds.

The final commands INVERSE and PRINT OVER refer to the way characters are displayed. INVERSE reverses the foreground and background colours for the indicated characters following the command and PRINT OVER is frequently used as a pseudo-sprite command to allow one character to pass over another.

We now turn to a reader with SPRITE problems. Mr P J Merrell of Cheltenham is a newcomer to computing and has been having difficulties with generating sprites in his programs.

Is there a better way to define a 16x16 sprite? Do you really have to use the double entry method?

The method Mr Merrell is currently using looks like this:

```
10 COLOR,1,1:SCREEN
2,2
20 S$=CHR$(0)+CHR$(
0)+CHR$(0)+CHR$(3)+
CHR$(7)+CHR$(15)+CH
R$(25)+CHR$(25)+CHR
$(31)+CHR$(30)+CHR$
(31)+CHR$(12)+CHR$(
7)+CHR$(3)+CHR$(1)+
CHR$(3)
30 S1$=CHR$(0)+CHR$
(0)+CHR$(0)+CHR$(19
2)+CHR$(224)+CHR$(2
40)+CHR$(152)+CHR$(
152)+CHR$(248)+CHR$
(120)+CHR$(248)+CHR
$(48)+CHR$(224)+CHR
$(192)+CHR$(128)+CH
R$(192)
40 SPRITE$(0)=S$+S1
$
50 PUTSPRITE0,(125,
90),9,0
60 GOTO60
```

Alternatively, DATA statements can be read into the SPRITE. This takes about four times longer to create the sprite but saves on memory and the time taken to type in the string data.

```
10 COLOR,1,1:SCREEN
2,2
20 FORX=0TO31:READA
:S$=S$+CHR$(A):NEXT
30 SPRITE$(0)=S$
40 PUTSPRITE0,(125,
90),9,0
50 GOTO50
60 DATA0,0,0,3,7,15
,25,25,31,30,31,12,
7,3,1,3,0,0,0,192,2
24,240,152,152,248,
120,248,48,224,192,
128,192
```

This does not give a substantial saving in time over the DATA reading method but its use allows small changes to be made to sprites quickly without having to redefine the SPRITE$.

```
10 COLOR,1,1:SCREEN
2,2
20 FORX=0TO31:READA
:VPOKEBASE(14)+X,A:
NEXT
30 PUTSPRITE0,(125,
90),9,0
40 GOTO40
50 DATA0,0,0,3,7,15
,25,25,31,30,31,12,
7,3,1,3,0,0,0,192,2
24,240,152,152,248,
120,248,48,224,192,
128,192
```

In a similar vein. sprites can be directly poked into video memory using the VPOKE command. SPRITE$ is stored in memory locations which may be found by using BASE. This returns the address in video memory of various storage locations depending on the bracketed number following the command. For sprite data this is BASE(14) which gives the location of the first byte of data for SPRITE$(0). The start location for the other sprites can be calculated by BASE(14) + S*32, where S is the sprite number:

```
10 COLOR,1,1:SCREEN
2,2
20 FORX=0TO31:READA
:S$=S$+CHR$(A):NEXT
30 SPRITE$(0)=S$
40 PUTSPRITE0,(125,
90),9,0
50 GOTO50
60 DATA0,0,0,3,7,15
,25,25,31,30,31,12,
7,3,1,3,0,0,0,192,2
24,240,152,152,248,
120,248,48,224,192,
128,192
```

```
10 COLOR,1,1:SCREEN
2,2
20 FORX=0TO31:READA
:VPOKEBASE(14)+X,A:
NEXT
30 PUTSPRITE0,(125,
90),9,0
40 PUTSPRITE0,(125,
90),9,0
50 FORA=0TO100:NEXT
60 VPOKE14358,248:V
POKE14362,216:VPOKE
BASE(14)+11,14
70 FORA=0TO50:NEXT
80 VPOKE14359,248
90 FORA=0TO50:NEXT
100 VPOKE14359,152:
VPOKE14362,248:VPOK
EBASE(14)+11,12
110 FORA=0TO50:NEXT
120 VPOKE14358,152
130 IFINKEY$=""THEN
130
140 GOTO60
150 DATA0,0,0,3,7,1
5,25,25,31,30,31,12
,7,3,1,3,0,0,0,192,
224,240,152,152,248
,120,248,48,224,192
,128,192
```

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In the Balance

Colin Wilton Davis looks at a new business utility

SPREADSHEET
Kuma
£39.95
Cassette

Spreadsheets are extremely powerful tools for any form of financial planning, be it for the home budget or for running a business. I was therefore quite pleased when this particular program arrived on my desk for review. The daddy of all spreadsheets was called **Visi-calc,** and his offspring includes **Vu-Calc** (for the Sinclair Spectrum).

For those unfamiliar with this family, a spreadsheet is used to organise figures in rows and columns, and to express relationships between groups of numbers by formulae of types ranging from Profit = Sales – Cost to much more complex mathematical expressions. Their power lies in the ability of a user to change just one of the array of figures and see the effect of the change on all the other related figures without having to re-calculate them individually.

This particular spreadsheet claims to allow the use of 256 rows and 256 columns, which by my reckoning should be 65536 numbers. This seems an extravagant claim in the light of the fact that the total memory capacity (64K) of an ordinary MSX computer is only enough to hold that many *characters,* let alone numbers, the formulae linking them and the program itself. However, I do accept that this program has a very respectable capacity, enough for many small businesses.

The program is on cassette, is written in machine code and is accompanied by a 15-page booklet. This is well written, and should be quite adequate for beginners and experts. When the program has loaded, the middle of the screen displays the visible part of the spreadsheet (no, you can't display all those rows and columns at once). The top shows the status of most of the working options, and the bottom shows the main command menu.

The program is flexible and easy to use — column widths are easy to alter, and it is simple to insert text as well as figures and formulae. Functions available for formulae, as well as addition, subtraction, multiplication and division include SUM, MAX, MIN and MEAN for a range of rows/columns. Maths functions like LOGs and trig functions are not there, but not many people want them in a spreadsheet anyway.

The examples in the booklet all worked, and the program made short work of examples which I have used on other and more expensive machines.

However, nothing in this world is perfect, so I must point out some deficiencies. The back of the box in which **Spreadsheet** is packed says 'A friendly HELP page can be requested at any time'. This is true, but your request will be ignored. The HELP page is not featured in the instructions or the menu, but to be fair, I don't think it is needed for such a friendly program.

One feature I would have liked is the option of entering a formula to apply to a whole row or column, but formulae have to be entered for individual cells.

The worst defect is much more important, and is in an area of which I was coming to expect much as I worked through the booklet — the printout. Most of the print commands will work with any printer with a Centronics interface, but there are commands for setting character size which will only work with Epson FX-80 printers or those with compatible control codes. Mine is a Mannesmann Tally MT80, and I was glad to see that I could use these commands successfully with the examples in the booklet.

With bigger problems, I was very displeased to find that only the part of the spreadsheet that was visible on the screen could be printed. After setting a line width of 132 characters, it is a great let-down to find that your text will only print across 5cm. Printing a larger spreadsheet would involve the use of scissors and glue, and this is not good enough for a program at this price.

I must add that the booklet is not misleading in this respect, but spreadsheets which are otherwise poorer do not have this limitation.

A fine program, largely spoilt by this unnecessary and important fault. A great pity, as Spreadsheet has many good features not found in its more expensive relatives.

MSX

Soft Options

Our reviewers guide your choice among the latest MSX releases

PSYCHEDELIA
Llamasoft
£6.00
Cassette

Llamasoft's guiding light, he who harbours a passion for llamas, camels and other such ungulates, has turned his attention towards the oriental computers. Yes, Jeff Minter has made the MSX scene with **Psychedelia,** the light synthesiser.

Always novel in his approach to the software market, the famous programmer has produced not one of his games but a form of entertainment. The program generates multicoloured patterns onto the screen which may be used as a light show to accompany your favourite music on your stereo.

There are two underlying modes of operation: automatic and joystick controlled. The range of options offered is truly amazing.

The basic unit of the image is the pixel which is a cursor sized shape. There are 15 shapes to choose from including the inescapable llama and camel shape. Any one of these may be selected to make up single or multiple images.

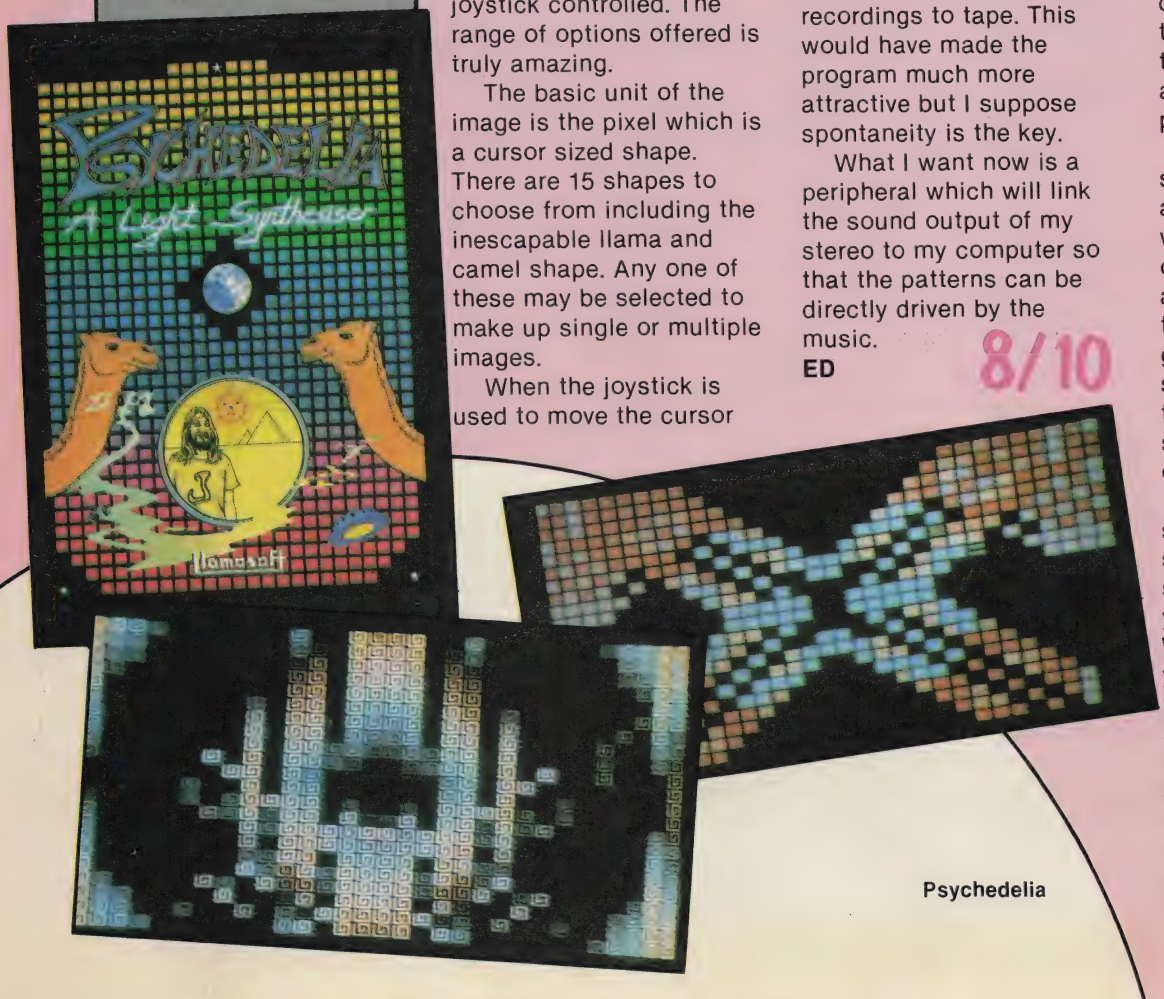
When the joystick is used to move the cursor around and the fire buttom is held down, the screen comes alive with vibrant colours as the pattern leaves a trail of pixels in its wake. It has to be seen to be believed.

The instructions are as detailed as possible but, because the effect created is visual, it is necessary to say 'try it and see'. Cursor speed, shape and the length and duration of the trailing pattern can all be set to suit your requirements. Once selected the parameters can be stored on a function key for instant recall.

In addition to all this, about half an hour's virtuoso joystick manipulation can be recorded in the computer's memory and played back at will. Unfortunately the program does not include the facility to save these recordings to tape. This would have made the program much more attractive but I suppose spontaneity is the key.

What I want now is a peripheral which will link the sound output of my stereo to my computer so that the patterns can be directly driven by the music.

ED 8/10



Psychedelia

STARSHIP SIMULATOR
Panasonic
£18.80
Cartridge

Could you be the next Dan Dare or Han Solo? Here is your chance to try your skills as a spaceship pilot.

You cruise around the universe, and depending on which level you choose, you have to destroy a certain number of the Cygnus ships. It would help if you had four pairs of arms for this game, because a lot of different buttons need pressing. The 'stop' feature is a great help.

At the start of the game you are taking on fuel at a space station. Looking at your instruments, you can see your equipment — four shields, a cannon beam, six torpedoes, a short range engine, a warp engine and three probes. The cannon beam will be used most, but is the least effective. It overheats in a few seconds, as shown by an indicator, and then conks out. The six torpedoes are better than the cannon, but don't do as much damage as the probes.

After leaving the space station, you are warped to a sector of the galaxy where the Cygnus ships can be found. As it takes about half a minute of play time to make contact, this game is a bit slow in starting. Now all you have to do is shoot down a few space ships, but don't get over-confident.

You peer into black star-filled space trying to spot the enemy. Once spotted, you home in using your short-range engine. While all this is going on, you must keep an eye on the head-up display. This shows: ship's position, shield position, power available for the shield, speed of your spaceship, and distance to the Cygnus ship. As well as all

Starship Command

Finders Keepers

that there are bar indicators which tell you more information about energy levels and so on.

All of this took me quite a while to figure out. Without the manual, I would have been completely lost. But once you get going it is good fun. The graphics and sound are realistic, and it gives an enjoyable space adventure.

MB 7/10

FINDERS KEEPERS
Mastertronic
£1.99
Cassette

If you have always imagined yourself as a knight errant, here is one way to indulge your whim.

The King of Isbisima has selected you to venture into the Castle of Spriteland to find a suitable gift for Princess Germintrude's birthday. The castle is not the friendliest of places, being overrun with grisly grouls and ghastly gremlins who do not suffer stangers gladly.

This is a platform maze game with the added delights of allowing you to examine objects before you decide to take them with you. You can only carry five items at a time, so you must consider each new find's desirability carefully before taking it along with you. If you later change your mind then the object can be dropped or sold to one of the ghoulish traders you meet along the way. Some of the objects may appear useless at first but will later combine to form something valuable.

Within the many rooms in the castle you may also find two mazes which scroll up and down as you move around the avenues. The scrolling tends to be a bit jerky at times but I soon got used to it.

Eventually a moral decision will have to be made: is it better to stay loyal to the King or to make off with the booty and live a life of luxury?

At just under £2, **Finders Keepers** offers fantastic value for money. The quality of the graphic and lasting appeal is greater than many games costing four or five times as much. At this price you cannot go wrong.

ED 7/10

SPRITE EDITOR
The Electric Studio
£7.95
Cassette

One of the strongest features of the MSX range is the ability to manipulate sprites with BASIC statements. The 32-bit sprites in particular can be used with stunning effect. Designing sprites with graph paper and the like can be an extremely tedious business, particularly if an attempt is to be made to animate them by using a number of similar sprites in succession. Anything which can take the tedium out of that job deserves success, and this program is designed to do just that.

The program is on cassette, with a different version on each side; one version uses a joystick, and the other uses the Sanyo Lightpen. My cassette had the labels on the wrong sides, but the confusion didn't last long. On loading, a 16 x 16 grid is displayed over most of the screen, with a group of six icons and five options with actual words. An arrow-shaped cursor is moved by the joystick to the desired icon-word, which is then selected by the firebutton.

If you select the Pencil, you can fill in squares in the grid by moving the cursor to them and pressing the trigger. I found this easy with a rather stiff Atari joystick, but difficult with the very responsive Sony joystick, which kept making me overshoot. The Rubber option allows you to erase squares instead.

When you want to see a sprite-sized sample of your work, the View option will provide this. In this way, you can build up a file of 64 sprites. As well as building sprites from scratch, you can reflect or invert existing sprites, or you can copy a sprite and change it slightly — this is great for animation, and the Animate option will cycle through a succession of up to ten different sprites in any

order from your file of 64 while you move them across the screen.

A file of sprites created in this way can be SAVEd to tape as a named file, and there is a LOAD command to get them back for further editing. The saved file may also be loaded by your own BASIC program, and the necessary instructions are provided. The instructions accompanying the cassette are on a single, small sheet. You must be careful not to lose the paper before you have got the hang of using the saved sprites in your own program, but apart from this, the paper isn't really needed. The program is very easy to use without referring to anything except the screen.

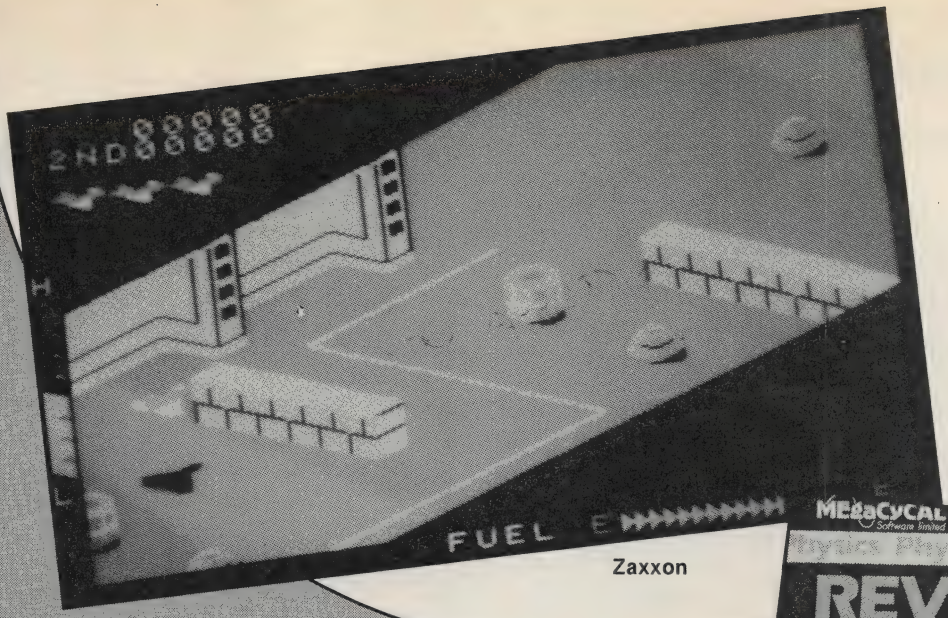
There are only two things I have against this program. The first is the trivial point that it only deals with 16 x 16 sprites. Admittedly, these are far more tedious to design than 8 x 8 sprites, and if you don't need more than 64 sprites, you can use just a quarter of the grid to design the smaller kind.

The second is that your file will hold all 64 sprites, and if you don't want more than about eight of them, it would be quicker and less prodigal of memory to define them with lists of numbers. It would be useful for this purpose of the appropriate list for a defined sprite could be generated by the program. The program is incompatible with the Sony MSX Disk system as it stands, which is a pity but not yet something for which to deduct points.

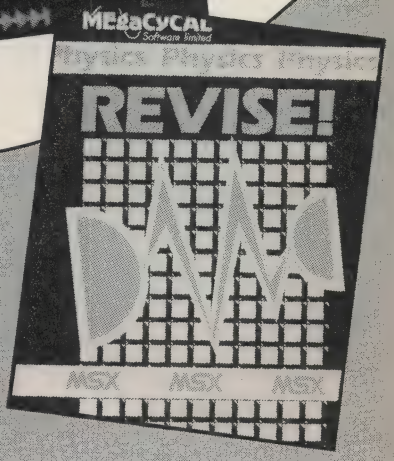
I can thoroughly recommend this program to anyone who wants to design their own sprites, particularly if they want to animate them.

CWD

8/10



Zaxxon



ZAXXON
Electric Software
£11.95
Cassette

Nice to see that one side of this tape loads at 2400 baud instead of the usual 1200. This means a loading time of just under two minutes instead of just over five. Some recorders will not cope with this higher speed load though.

Zaxxon is a 3D arcade game in which you must fly a plane from asteroid to asteroid destroying enemy installations as you go, eventually doing battle with one of the Zaxxon robots and their heat-seeking missiles.

The screen gives an oblique view of the action looking from around 45 degrees from the rear of your craft. Distances and alignments are difficult to judge so that guides must be used. As you fly across the asteroid your plane casts a shadow and this can be used for alignment with your target. When approaching a protective wall, firing your laser will soon tell you if vertical or horizontal adjustments are needed.

There are nine types of target to hit and skimming the ground is the only way to get them all. The first level has only passive gun turrets, fuel tanks, walls and the occasional deadly missile to be overcome. As the levels increase robot missiles appear and the gun turrets shoot back, culminating in the deadly confrontation with the Zaxxon robot itself.

Between each level there is a deep space encounter with the enemy fleet of planes which must be attacked head on at the correct height. A symbol appears on the screen when a target is in range but be careful — these targets shoot back or may even ram you.

The graphics are superb and even though some of the original arcade game features are missing the challenge is just as enjoyable. One of the best games currently available for the MSX.

ED

8/10

REVISE PHYSICS
MegaCyCAL Software
£8.50
Cassette

If you have bought your MSX computer with the intention of putting it to serious use, you have probably noticed the virtual absence of educational software on the shelves of your local computer shop. It was with great interest, therefore, that I loaded this program into my Toshiba HX10.

Most of the best educational software is written for the BBC micro or for the Research Machines 380Z. Software support for educational users of other machines is very poor and it is clear from the packaging that MegaCyCAL have converted this program from a BBC version. The tape contains two different programs, which between them cover the topics of Mechanics, Matter, Motion, Waves, Light, Sound, Electricity, Magnetism, Electrons, Atoms and Nuclei.

Educational programs should really do just that — educate. This one makes no attempt to help teach physics, but rather sets a series of multiple choice questions based on typical exams set in recent years.

The two programs contain 90 questions split into six short tests and the program allows you to choose which area of the subject you want to tackle. Many of the questions are accompanied by graphs or diagrams on the screen, although the standard of the graphics is rather crude. Was that really a spring balance?

Each correct answer scores one, as you might

expect, whereas an incorrect response gives you the choice of asking for help or trying the question again. The idea of being able to ask for help is a good one, but with only 90 questions, anyone intending to use this as a revision aid will soon run out of questions. The standard of questions is about that of 'O' level.

A competent program, but I can't see it being of much help in the classroom. It may be a useful program for those who are preparing for 'O' or CSE exams in physics, although I'm not convinced that it will be of any greater benefit than trying a few past papers.

SL **5/10**

GOLF
Panasonic
£18.80
Cartridge

This cartridge game deals with the details of golf well enough, but it simply is not up to the standards set many other games now available.

The starting instructions are somewhat complicated, but once understood follow conventional golf. Your bag of clubs is limited to the odd numbers only, ie 1 and 3 woods, 3, 5, 7 and 9 irons. Setting direction of shot is done by the peculiar method of moving a front marker around the edge of the screen. Once the club and the direction have been chosen, the only other thing you need to do is decide on the power of the shot. The play is accompanied by over-enthusiastic and intrusive sound.

When you reach the middle of the green, the screen changes to show a close-up of the putting action. Play is confined to the green — no matter how hard you hit the ball, you remain on the putting surface.

It is the graphics which really let this game down. The coarse, low resolution detail makes it look like something from the 1970s era of the early PET or Tandy computers, of blessed memory to some of us old-timers. Worst of all, the action is shown in two dimensions only.

Not much to hold the interest or generate excitment here.

CB **3/10**

HOLE IN ONE
Morwood
£16.45
Cartridge

Fore! This game is so realistic that it really does feel like being out on the golf course. Of the two cartridge golf games out this month, **Hole in One** is undoubtedly the better.

After plugging in the cardridge, you are given a tour of the course, The aerial view slides down the screen like a roller blind, revealing bunkers, water hazards, trees, and lots of little details like the clubhouse and even golf carts. You select your skill level — average, expert or pro — and the number of players, and you are ready to go. There are no on-screen instructions, but you probably know by now how golf is played. If you don't there is a little booklet which explains it all.

Play starts by selecting a club and direction. Different factors such as the strength of the wind, the way the land lies, the length of the hole in metres, and the various hazards have to be taken into account. These are shown either on the aerial view of the hole, or in the information section of the screen on the left hand side.

The clubs on offer are four woods, seven irons, two wedges and a putter. Basically the lower the number of the club, the further the ball goes. The wedges are used for getting out of trouble, like when you land in a bunker. Once on the green, you use the putter.

But hitting the ball is not just a matter of selecting a club and a direction. You must also decide on the power to apply and whether to curve the shot (put spin on it). Hole in One deals with this in a delightful way. On the left hand side of the screen you are given a 'power bar' — an indicator which surges backwards and forwards. This reminds you of those practice swings you see golfers taking before they hit the ball. You have to hit the fire button at just the right point to catch the power you want. Similarly, the curve option swings from left straight through to the right, and has to be caught at just the right spot.

Once the power and curve valves have been selected, the information part of the display changes to show a lady golfer taking the shot. After she hits the ball, its flight is shown in an impressively realistic way. I especially liked the way the ball gets larger as it rises up and casts a shadow as it nears the end of its flight. There are just the right amount of sound effects, too.

The game follows the rules of golf to perfection, with the penalties for out-of-bounds, the method of dropping when you land in a water hazard and so on, all faithfully produced. Land behind a tree, and you must either chip over it, or hit away to one side — if you don't, then your ball just bounces back.

The game has all the elements to make it a real winner — the graphics are excellent, sound is used in a way that enhances the game, it is easy to get started, yet contains many twists and subteties. It is true to the real game of golf, and would be helpful for a learner. It was played with excitement by youngsters, and with interest by adult golfers.

This cartridge is well worth buying.

MB **9/10**

Hole in One

DECATHLON
Activision
£11.99
Cassette

Attention computer sports fans — try your calloused trigger fingers on this one.

Reviewing **Decathlon** has rendered my typing fingers useless (both of them), and I have resorted to typing with my fists. For the unaware, the aim is to gain supremacy at ten different sporting events: 100m dash, long jump, shot putt, high jump, 400m, hurdles, discus, pole vault, javelin and 1500m. Briefly, this is achieved by pummelling the cursor keys or frantically waggling the joystick to make your athlete run as fast as possible. In the jumping and throwing events this is followed by pressing the fire button to achieve the required action.

The options allow you to challenge either the computer or a human opponent, but the latter is preferable because the computer's performance is not particularly challenging and anyway, why become a computer recluse when you can share the fun.

Realistic movement is the most impressive thing about this game and it is obvious that no compromises were made when converting it for MSX computers. I must admit that when I played the game my mind was totally involved with athletics and not aesthetics.

The killer event is the 1500m race. It seems as though it will never end and just when you reach the last few hundred metres, your athlete tires and you have to dig deep into your fingers' stamina reserves to maintain a final sprint.

Definitely one not to be missed by sporty types and masochists. I must dash off for a finger massage to recover.

ED **8/10**

GUMSHOE LOGIC
MegaCyCAL Software
£9.20
Cassette

This unusual educational program places you in charge of a private detective agency. Your object is to solve the cases, presented in the form of logic puzzles, whilst keeping the business solvent. Once the program has loaded, you must choose the level of difficulty from very easy to extremely difficult. The profit made from a case is related to the level of difficulty chosen.

The program is menu driven, the first menu being your casebook. From this menu you can choose one of four alternatives — the case description, which is selected at random from one of the cases in memory; your current financial status; your catalogue of Snouts; and the start of the case. Choosing any option other than number four gives you a background decription of the case, whilst the final option takes you to a second menu where you can either buy information from one of the snouts, return to the first menu or present your solution to the case. When you think you have the solution, your client gives you a grilling and if you present an incorrect solution you have the option of seeing where you went wrong.

Because of the random way in which the cases are selected, the connections and solutions will be different every time. Remember too that the solution to logic puzzles depends as much on negative inferences as positive ones.

This is a program I thoroughly enjoyed. Can you trust the evidence of your snouts? With a man like Sharky, a compulsive liar, you never know whether he is telling the truth, but then his knowledge comes cheap. Arfur, on the other hand, can't even spell his own name but with a man of his size, you spell his name the way he says. Honest Joe will give you steady, reliable information, at a price, whilst El Caro is in the big league and at £50 a meet, he needs to be. Once you arrange to meet one of the sharks, you will have to ask questions wisely, or you will be wasting your money.

The game does not set out to teach you anything, but helps to make you think logically. The solution to each case depends on pure logic, and it is presented in such a way that you don't lose interest after a few minutes. This is a nicely presented educational package which, unlike many, won't end up in the bin after a few goes.

SL **8/10**

GODS OF THE TOMB
MegaCyCAL Software
£9.20
Cassette

Unlike their Physics program, MegaCyCAL seem to have written this game specifically for the MSX standard, such is the quality of graphics and sound effects. The program uses 60K of memory and takes nearly 12 minutes to load from tape. This should give you an idea of the number of questions it contains.

A quiz program is not, strictly speaking, educational, in that it doesn't directly teach you anything, but it can be a fun way to practice and test knowledge already gained, especially if the quiz contains good graphics and sound to keep the attention.

The setting is ancient Egypt where tomb robbers have smashed the six sacred mummies in their pyramid. Before entering the first pyramid, you must choose two topics from the four options — Geography, Natural History, Words or Music. Once inside the pyramid, your guide meets two guards standing over the invisible mummies. Each right answer puts a fragment of a mummy into place and when each mummy is complete its guard disappears.

You must complete two mummies before moving on to the next pyramid. If you answer correctly

before the time runs out, you get a time bonus point, which can be used later to save your guide from death. Each incorrect answer sends your guide one step nearer to death in the room of slowly closing walls. After 50 questions, any spare bonus points are used to complete the mummies, but if you don't have enough points, it is back to the start again.

In the second pyramid, the questions are chosen from History, Literature, Religion and Sport, and in the third pyramid, one of the sections is compulsory general knowledge while the other is chosen from arts or sciences.

The guards in the pyramids are all different, but otherwise the game is very similar in each section. Once you have found your way through all three pyramids, you receive the blessing of the Sphinx. With over 600 questions in memory, which are randomised so that every run of the game is different, it will take you a long time to complete the quiz.

This is an entertaining semi-educational game which can be thoroughly recommended.

SL **8/10**

SUPER SNAKE
Morwood
£16.45
Cartridge

Chomp. Hungry work this. **Super Snake** is a very simple and easy-to-learn game. You have to guide a snake around the screen eating up boxes. The aim is to make the highest score, while avoiding hitting the outside wall, or eating yourself, all inside a time of sixty seconds. The boxes you gobble score points from 100 up to 900. Mystery boxes are shown by question marks. These give a random amount of points. But watch out — this can sometimes be a minus score.

Another kind of box contains a bonus in the form of fruit — cherries, strawberries, pineapples or skulls. 'Skulls?' I hear you say. 'They are not fruit.' Quite right, they are not; in fact the skulls deliver a nasty surprise — swallow one and your score is halved.

Other delicacies to eat are the rice cakes — red, yellow or green — which scamper around the screen looking like space invaders. Eat a red one and you cut your length down to your original size. Yellow ones extend the time of the game by ten seconds. Green ones give you 2000 points to set against any minus scores you might have.

Eating yourself, or hitting the wall around the outside of the screen, kills you, but this snake has endless lives. Getting killed only means minus points. And hitting the wall is not always bad — there are warp tunnels, which stay open for five seconds. Going through a tunnel takes you to the other side of the screen, and scores 500 points.

In the two player version of the game, both players are snakes on the screen at the same time. This is a more interesting variation on the single game, which is best played with two joysticks. You can either score for yourself or against your opponent, depending on what you eat.

The game is easy to master, with simple jolly graphics. As in many arcade games, it has instant appeal, but can become boring after a while.

MB **6/10**

FLIGHT PATH 737
Anirog
£7.95
Cassette

A conversion from Anirog's expansive catalogue, this flight simulator is their first MSX title.

The program has six levels which are shown on the opening screen to the accompaniment of haunting music which appears to drift out of sync. The levels range from first solo flight to test pilot, but all the flights are essentially the same format.

Firstly of all you must align your 737 on the runway using the function keys for throttle and the joystick for direction. The graphic display tells you the heading you should be on and an indicator shows your current heading.

When the two numbers concur you are ready for lift off.

When you reach sufficient speed with your flaps down the plane rises and you see the runway fall from sight. You must now climb over the mountain range, remembering to raise your flaps and undercarriage at the correct moment as well as checking that you are within the permitted speed range — the mountains increase in height with each succeeding difficulty levels. A ground warning light goes out when you are flying at the correct height to fly over.

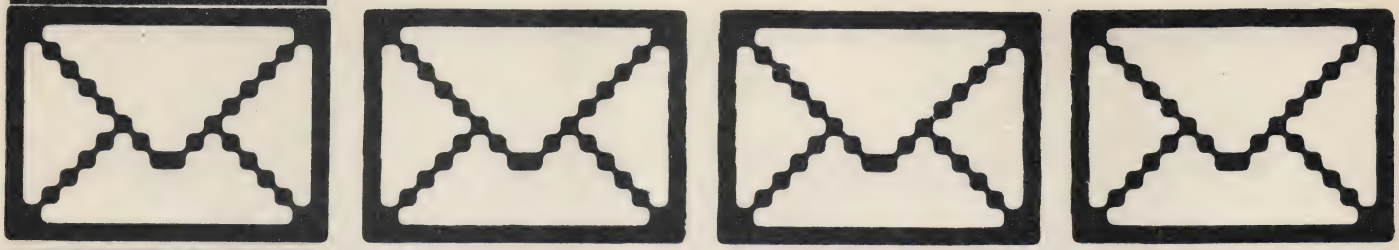
You must once more adjust your heading to the new value display on the screen. At the higher levels of the game you will also have to extinguish the occasional engine fire by hitting a key when a warning light appears.

Safely across the mountain, you may start your descent to the airport, throttling back to prevent a build up of speed. You must also bear in mind that the runway is just 25 miles away. At ten miles from the runway a guide light glows white if you are too high for landing, red if you are too low and green for on course.

As the level of difficulty increases the length of runway decreases and eventually reverse thrust is needed to stop in time. The smoothness of your landing also becomes more critical.

This is a good introduction to flight simulation. After a while the same old routine can become a little boring and the sluggishness of the controls is irriating. Quite good though not wildly exciting graphics make this a nice one for the novice.

ED **5/10**



Feedback

No go zone

Dear Sir,
My computer is the Toshiba HX-10.

I have recently purchased **Disc Warrior** (Alligata) and after numerous attempts am unable to proceed with the game after I have entered the yellow doors in zone one.

I can successfully enter zones one, two, three and four. After I pass through the yellow doors in zone one (with the aid of the yellow key from zone four) I enter a zone to which no number is given only to be trapped there.

I have transported myself with the aid of the teleporter, only to be taken back to zone one.

Please help. Can you tell me what to do next?

L Lloyd
RAF Laarbruck

The yellow door is a red herring — find a travel disc and go elsewhere. Have you got the red radar component? These hints are straight from the Alligata's mouth — I hope they solve your problem.

Hisoft fan

Dear Editor,
I am a fan of Hisoft of Dunstable having (and using) their two superb packages for MSX (**Devpac** and **Pascal**). I would endorse most of Conall Boyle's comments in his review of Pascal (MSX User May 85) while disagreeing with him on the matter of documentation.

The Programmer's Manual supplied with the product is in my opinion — and I have been using it for some time — every bit as good as the software itself.

I know myself how easy it is when writing user guides and technical documentation to produce verbose and impressive looking documents that tell you nothing, or at least not what you want and need to know. In contrast with this the Hisoft product is concise yet user-friendly, containing all the essentials. Also, it doesn't contain masses of misprints and misleading information.

My only gripe at the moment is that I can't get a 32K — 64K upgrade for my Yamaha computer. Does anyone else out there in computer land share this sentiment?

Alan C. Pleasance
Bushey, Herts.

Unfair trial

Dear Sir,
Your review of Hisoft Pascal (May 85) was a little flawed by the time trial comparison, which was unfair both to MSX BASIC and to Hisoft Pascal.

The programs were not the same. The Pascal version stepped through the array one element at a time in line 300, whereas the BASIC program steps two at a time in line 170. The BASIC version is correct. The even numbers cannot be prime. The Pascal program is doing nearly twice as much work.

The BASIC program suffers from being unstructured. This makes it harder to read, and slows its execution. FOR loops are generally faster than the equivalent GOTO code.

The BASIC program does not have its variables defined as integers whereas the Pascal program does. Integers require less storage space and are quicker to use in arithmetic. They should be used where possible. I used a DEFINT statement.

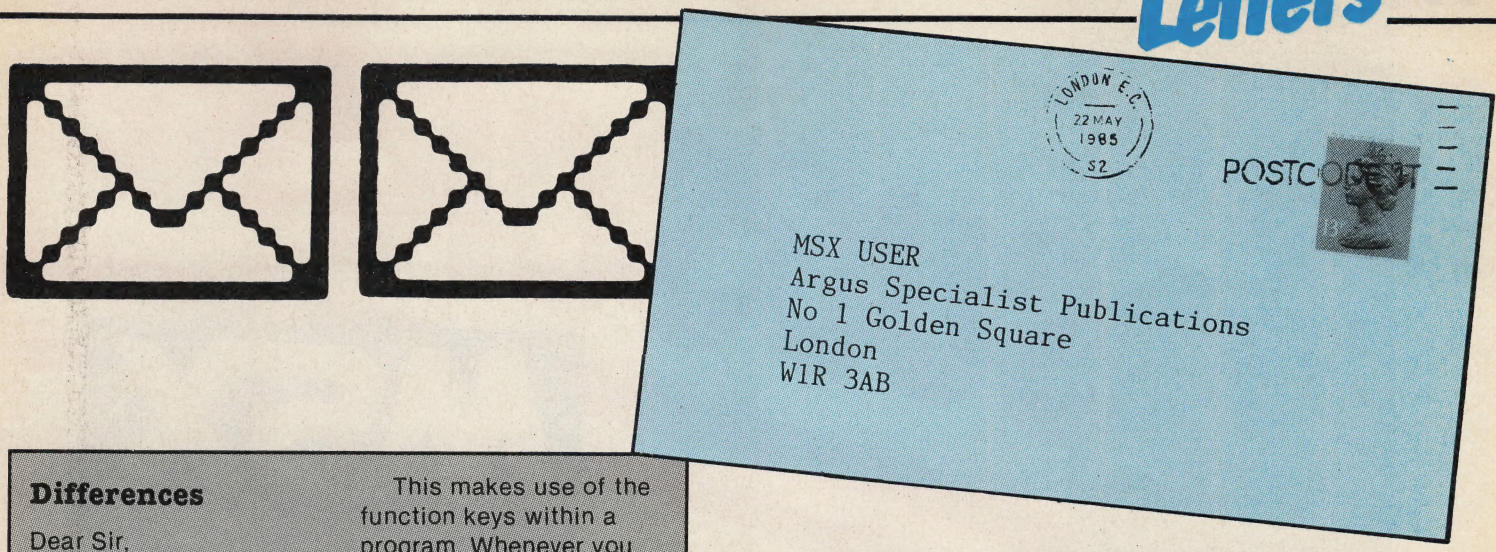
The most significant handicap for the BASIC code probably demonstrates a strength of the compiler. The method does not test divisors above the square root of the number being tested. This is correct. If one divisor is greater than the square root of the number, then the other must be smaller, and would have been found already. In the BASIC program the square root is calculated for every test. This is the most time consuming calculation in the program.

The Pascal compiler probably calculates it just once at the begining of the loop. With this calculation in the loop the BASIC program using STEP 2 took 5 min. 42 secs.

I then inserted line 155 SI = SQR(I), and changed SQR(I) in line 170 to SI. The program then ran in 1 min. 31 secs. Both these times include printing time.

It is possible to improve on these times by merging lines and omitting spaces, and there are better ways of solving the problem.

D. F. Cox
Rushden, Northants



Differences

Dear Sir,
The letter from Pat Fitzpatrick in the March issue's First Aid caught my interest. He asked about the differences between MSX and SV BASIC. As I own a Spectravideo 328 myself, perhaps I can be of some help.

To begin with, the problem with the SCREEN and COLOR commands: it can be solved by including an extra SCREEN 1 command after the new COLOR command, like this:

```
10 COLOR 15,1,4
20 SCREEN 1
30 COLOR 12,6,10
40 SCREEN 1 (New command)
50 GOTO 50
```

Now the background colour is 6! I suppose this is nothing but a bug (whatever Spectravideo say) and the way to get around it is to always include an extra SCREEN command after a new COLOR command.

As for differences between MSX BASIC and SV BASIC, for example KEY ON/KEY OFF (MSX) is equivalent to SCREEN 0,1/ SCREEN 0,0 (SV). KEY ON is used in SV BASIC in the same manner as SPRITE ON, INTERVAL ON, etc, like this:

```
10 KEY ON
20 ON KEY GOSUB 100,
200, 300
```

This makes use of the function keys within a program. Whenever you press F1 the program jumps to 100, if you press F2 it jumps to 200 etc. Very useful command!

The CLEAR command doesn't work on the 328 you say, but it certainly works on my computer.

To print text on the higher resolution screens, in SV BASIC simply use LOCATE and PRINT in the same way as in SCREEN.

There are other differences between SV and MSX, but those I've mentioned are the most significant, I think. It is quite easy to convert a MSX program to the non-MSX Spectravideo 318/328, so I've had good use of your mag.

By the way, it seems that a MSX adapter is on its way for us 318/328 owners, so we can buy MSX software and run them on our 'almost-MSX' machines.

I would be glad to hear from Pat F. or any other 328 owner of course. As I live in Sweden, it would be fun to receive mail from anyone in the British Isles. It seems to me that the 328 is a rare machine in GB, whereas it is more common in Sweden, so perhaps I could be of some help with software, own programs etc.

Ulf Larsson
Videgatan 14A
S-582 46 Linköping
Sweden

Desperate

Dear MSX User,
I am in desperate need of help. How do you get past level 9 in **Hunchback?** Please tell me or give me some sort of clue before I lapse into a state of mental depression.

Matthew Gee
Solihull, W. Midlands

The secret, I am told, is to jump the first two fireballs, then leap onto the first rope. As the other fireballs come towards you, jump up the rope, and then when the coast is clear proceed to the other bell ropes. But beware, all is in the timing.

French connection

Dear MSX User,
There is a WH Smith store in Paris and it is in this way I found your magazine.

Presently in France there is no MSX magazine so MSX User is welcome in our country.

I have a MSX computer YENO DPC 64 manufactured by Daewoo in Korea. Yeno is the French branch of SEGA Japan.

So I should be very glad to correspond with British MSX Users to exchange programs and different information regarding computers.

Jean D'Audignac
25 rue de la Chine
75020 Paris
France

Darts miss

Apologies are in order for the gremlins which made mischief with the Darts listing in our June issue.

Lines 3170 – 3190 and 2030 were omitted and lines 3250 – 3290 were repeated The missing lines were:

```
3170 '*
3180 '* Clear table
3190 '*


2030 IF R>31 AND R<40 THEN TM=TM+(3*T
T(NUM)):MES$="Treble"
```

MSX

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